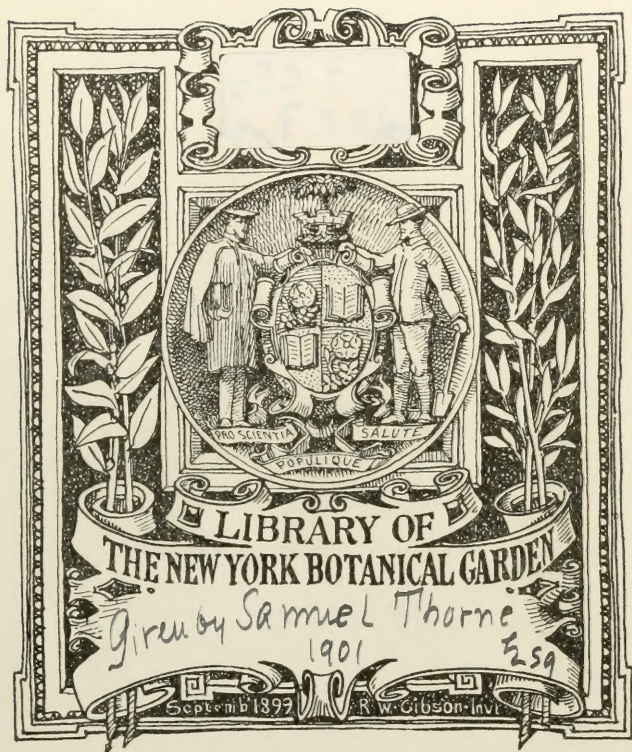










*England's Glory,
The property of Mr. R. Taylor of Peterborough, and the Prize Draft-horse at the Warwick Meeting of
the P.T.S. of England July 1859.
London. Published by Rogerson & Telford 246 Strand. 1861.*



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THE FARMER'S MAGAZINE.

VOLUME THE NINETEENTH.

(THIRD SERIES.)

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THE FARMER'S MAGAZINE.

JANUARY, 1861.

PLATE I.

PORTRAIT OF THE DUKE OF RUTLAND.

PLATE II.

ENGLAND'S GLORY.

A CELEBRATED CART STALLION, THE PROPERTY OF MR. B. TAYLOR, OF PETERBOROUGH.

THE DUKE OF RUTLAND.

Charles Cecil John Manners, sixth Duke of Rutland, was born in the year 1815, and succeeded to the title on the decease of his father, in January 1857. The present Duke completed his education at Trinity College, Cambridge, where he graduated M.A. in 1835. Two years subsequently he entered the Commons' House of Parliament as a Member for Stamford, for which borough he sat until 1852, when he was returned for North Leicestershire, a post he only relinquished on his accession to the peerage. And then Dod goes on to assure us that he is Lord-Lieutenant of the County, a Major in the Militia, the patron of some thirty-odd livings, is unmarried, and so on.

But it is hardly on any of these showings that the portrait of the Duke of Rutland appears here. It is rather as an enlightened country gentleman, a fine horseman, and true sportsman, and the still liberal exponent of those princely hospitalities, the very fame of which have become a national tradition. The glories of Belvoir suffer nothing in their present keeping, and whether we look to the stable of horses, the kennel of hounds, or "the company" at the Castle, we shall find either alike worthy of those good old times when the dandies of

the day came to stop for "the season"—when Assheton Smith ordered his muffins, and Brummel sipped his claret as it flowed fresh from the cask. The Duke's name, in fact, will live for itself. As the young Marquis of Granby, a title by which he was so long and so familiarly known, he at once entered upon the duties of his station. As the son of a large landowner he made the cause of the tenantry his own; and though fighting from the first a losing battle, the energy and courage with which he threw himself into the struggle will never be forgotten. It was, indeed, during this anxious crisis, that the Agricultural Hall at Waltham was erected, mainly at the instance of "the Marquis," and where the meetings of that influential association are still held. Built of Ancaster stone, and admirably adapted, by Wilson the architect, to its purpose, the Hall stands as something of a monument to his Grace's exertions in the cause, and who, both as the Marquis of Granby and the Duke of Rutland, has continued President of the Society to whose proceedings the edifice is devoted. The Belvoir tenantry are themselves deservedly distinguished as amongst the first of their order, and nothing can exceed the good terms upon which

they live with, and the respect in which they hold their landlord. The confidence in each other, so characteristic of the Lincolnshire lettings, has no higher example than that which has so long existed between the Dukes of Rutland and their people. On either side it is preserved as something of a hereditary right. Of the poor the present Duke is equally mindful, as he is discriminate in the application of his bounty; and the intellectual advancement of those about him is one of his chief studies. He contributes munificently to the establishment and maintenance of schools, and all similar institutions, while he was very instrumental in bringing "the Middle-class Examination" system to Grantham—a benefit, however, of which the town does not appear very ready to avail itself. But Grantham owes much to his Grace in other ways, as we heard and saw on all sides in a recent visit to that high capital of ploughs and steam-engines, of pork-pies, and gingerbread nuts.

And, of course, we went on, dipping into "the Vale," hearing still of "my kind Lord Duke," as poor Will Goodall called him, and no little of Will himself. And there was something of a direct sympathy for us now, comparative strangers though we were in the Duke's country. For when Goodall was just entering with that kindest and best of masters the late Mr. Drake, we ourselves were creeping up on a grey pony to "Chilton Village," "Ryecot Kennel," "the Quarters," or some other outlying Meet, with them. There could not have been a better school for a young one, as many an Oxford "man" can tell—the kindly word, the half-shake of the head, and the gentlemanly reproof that kept those large fields in order—while "Young Sir Henry" and "Mr. John" would show them the way, and old Griff Lloyd grumble along on his grey, never quite happy after he lost his dominion. Will Goodall, then, as we can give personal assurance to, came of a good school, and he did all honour to his bringings-up. As they still talk of him about Grantham, "he was the most genial companion, the boldest rider, and the best-hearted huntsman in England." And the Duke was worthy of, as he could appreciate, such a servant. He at once undertook to provide for the widow, who lives in a house at Croxton, with her large family put into all sorts of ways of getting on. His selection of a successor to Will's horn is as well spoken to by the hunt; and though it must

be somewhat trying to follow so "well graced an actor," Cooper, we are told, has already won the good opinion of his field, alike by his ability and conduct—"a keen hand and daring horseman." In his keeping the blood of the Rallywoods promises still to prosper. And the Duke, too, it must be remembered, is as keen as ever, and might still face the Croxton park wall. It was only last season that, in the Shoby Scholes day with the Quern, he was one of the very few who lived through that fast thing at the finish.

Unlike his lamented father, the Duke of Rutland is no racing man, and the deeds of Flambeau and Rat-trap find little favour in his sight. Although a member of the Jockey Club, he will often be busy in the preserves at Chieveley, even when on the Heath they are wagering over a Cambridgeshire or a Clearwell. At home, however, he takes to it a little more kindly, especially at his own pet meeting at Croxton, where the Stokes' and the Burrows' bring out that wonderful class of cock-tail, with just the stain and no more, and that shall hereafter carry the Duke and other thrusting welters to the fore over their own dearly beloved Vale—

"There's not in this wide world a valley so sweet."

His Grace, too, is generally one of the stewards at Leicester; but we missed his stalwart figure there this autumn, when the rustics were hurrahing at Lord Stamford, and Newmarket jockeys riding races on one side of the hedge, and reapers cutting wheat on the other. The Chieveley choice over again!

One word more, and we have ended at our argument. We will jot Belvoir about with a thriving tenantry and an improving peasantry. We will fill the Castle with company, the stables with horses, and the kennel with hounds. We will take in, from our point of view, the village-school and the Farmers' Hall; and we will dwell yet a little on one spot here in the range of that noble domain—where the rifle butt is erected, and whither the volunteers are marching. There are none more welcome; for, from the first, the Duke of Rutland has taken a strong interest in the movement, and done all he can, here again, to develop that sense of duty between man and man, upon which the welfare of all so intimately depends.

ENGLAND'S GLORY.

A CELEBRATED CART STALLION, THE PROPERTY OF MR. B. TAYLOR, OF PETERBOROUGH.

England's Glory, bred by Mr. Woolsey, of Newton, near Wisbeach, in May, 1851, is by Brown's England's Glory, out of a black Lincolnshire mare of Mr. Woolsey's, by Cork's Thumper, which horse was by Ewin's Magnum Bonum.

Brown's England's Glory took the first prize at the Great Show of the Royal Agricultural Society held at Windsor in 1851; as well as another first prize of the Manchester and Liverpool Association in the same year. He was by Seward's Major, twice a prize horse at Wisbeach—Major by Purrant's Honest Tom, by Goodman's Honest Tom, who in turn was by another England's Glory—Mr. Bingham's—that took the prize at Lincoln three years in succession, and for which his owner refused four hundred guineas. Going a step further back, the gr. gr. gr. gr. sire of our portrait was Wiseman's Honest Tom, purchased by Mr. Wood, of Cottingham, for four hundred guineas.

In 1854, when rising three years old, England's Glory was shown at the Peterborough Meeting, and "highly commended." In the year following he took this Society's first prize—an open "All England" one without any restrictions whatever—and for the four next years in succession he invariably took a premium at Peterborough. The Committee of the Society, however, rather tired of this, and after his *ditto* in 1859, paid Mr. Taylor's horse the high compliment of specially prohibiting him from again competing. In 1857, after a very heavy season, England's Glory was exhibited at the Royal Agricultural Society's Meeting at Salisbury, where he obtained no notice excepting in one of our reports, which thus spoke of him:—"In class I. for agricultural horses we have thirty-seven entries. The best horse we saw in this class is England's Glory, now the property of Mr. B. Taylor, of Peterborough. Here is substance and style. Those who wish to breed for the London Market should employ this horse." Not a bad critique on an uncommended entry.

In 1858, when on his way to the Chester Show, England's Glory met with an injury from the violent shunting of a "goods" train on that to which his box was attached; and he was at once sent home again. The mark of where he was hurt is still very visible on the top of his quarter, but more so in the picture than the engraving. In 1859, having entirely recovered from his mishap, he went the round of the following meetings, at each of which he took a first prize:—the Peterborough; the Huntingdon; the Royal Society's at Warwick; the Lincolnshire at Grimsby; and the Yorkshire at Hull; with a second premium at Liverpool. Since then he has never been shown for a prize. In all, England's Glory has been exhibited eleven times, on nine of which occasions he took prizes, and once a high commendation. His premiums in "public money" amount to nearly a hundred and fifty pounds.

The stock of England's Glory have been almost

equally successful. At the Royal Meeting at Chester a two-year-old colt by him, also the property of Mr. Taylor, took the second prize of £15, and another prize of £15 in the "Local" class of the same show. This colt was then sold to Mr. Reed, of Beamish Burn, near Durham—the owner of the famous cart stallion, Nonpareil—for two hundred pounds; and at the next show at the Northumberland Meeting won the head prize of £20, open to all England and all ages. He beat eighteen others here, including the Salisbury prize horse Matchless. At the end of the season Mr. Reed took the three-year-old on to Morpeth, where he won another first prize, against a good field of all-aged horses. Another colt of Mr. Taylor's by England's Glory was shown as a three-year-old at Peterborough in the March of last year, when he also took the first All-England all-aged prize, defeating eleven others, amongst which were included Bay Emperor, the first prize agricultural stallion at the Royal Show at Warwick the year previous. Then, Mr. Sanday, the Leicester sheep breeder, sent a two-year-old colt by England's Glory to Canterbury, where he was highly commended, and £180 refused for him there and then. There is of course some more of the same good sort coming on.

England's Glory is a rich brown bay horse, handsomely mottled, standing seventeen hands and a half high. He has a kind head, with a good bright eye, a fine neck and a good crest. As we ourselves wrote of him at Warwick, "Judged by their own merits, and altogether independent of any peculiar fancy or fashion, the best two stallions for agricultural purposes were the first prize dray horse Mr. B. Taylor's 'England's Glory,' and Mr. Holland's two-year-old. The dray horse 'England's Glory,' got by 'England's Glory,' and he himself the sire of 'England's Glory,' an echo that must lead to confusion sooner or later, still bears marks of the mishap he met with on his way to Chester, but he shows remarkably well; lively and active, of immense power and substance, short on the leg, and very true in his symmetry, it is quite pardonable to find his owner challenging all the world with him." And, again, at Salisbury: "His legs are clean and unblemished, and his feet all one could wish. England's Glory is certainly a very grand first class style of horse." Further than this, he is very big in the girth, and his weight is declared to be over 22 cwt.

England's Glory has travelled ever since he was two years old, and until last season in the neighbourhood of Peterborough. After, however, he was shown at Great Grimsby, the Lincolnshire breeders wished to have him amongst them; and he was at Boston the following season, where he served mares at two guineas each. He will, most probably, visit the same district this year, with a guarantee of a certain subscription at three guineas each. He is a very sure stock getter, and Mr. Pishey Snaith reports that scarcely a mare about Boston has missed to him.

THE ATMOSPHERE AND THE SOIL.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

While the rain pours down upon our fields, as of late, in unusual quantities, our attention becomes more directed to the effect it produces on the soil, and to the good results of drainage. We have, indeed, more than one reason for cultivating such trains of thought: we are ever rewarded, in these studies, by not only the interesting knowledge we acquire, but by the profitable answers which Nature so often returns to our inquiries.

It may, then, be practically useful, if, in this wet season, we commune together a little upon these things—if we glance at the origin of our copious rainfalls, and consider how much distant countries unconsciously contribute, in this way, to each other's welfare—before we proceed to remark the results of some recent valuable observations on the effects produced by the presence of water, and the action of the atmosphere, in drained and undrained soils.

It is, indeed, as a writer in the *North British Review* recently remarks, only the breezes of the encircling air which flows above and around us, that makes the whole world kin. The carbonic acid with which to-day our breathing fills the air, to-morrow seeks its way round the world: the leaves of the date-trees which grow around the Falls of the Nile, will drink it in; it will add to the stature of the cedars of Lebanon; the cocoa-nuts of Tahiti, the palms and bananas of Japan, will change it into flowers. The oxygen we are breathing was distilled for us some time ago by the magnolias of the Susquehanna; and the great trees which skirt the Orinoco and the Amazon, the giant rhododendrons of the Himalayas, the roses of Cachmere, the cinnamon-trees of Ceylon, the deep forests of Central America contributed to it. The rain we have seen descending so copiously was exhaled for us from the warm surface of the ocean—was thawed for us out of the icebergs which have watched for ages the polar star.

The amount of that rain, in Surrey (where the average fall is about 24 inches: it was only 17.94 inches in 1858, and 22.25 in 1857), was about 20 inches in the last six months of 1859, and has been about 29 inches to December 1, in 1860, as will be seen from the following table, which shows—

THE RAINFALL AT CROYDON, 250 FEET ABOVE THE LEVEL OF THE SEA, IN THE YEARS 1859-60.

	1859.	1860.
January	0.89	2.45
February	0.78	1.00
March	1.06	1.88
April	2.36	1.55
May	2.74	3.05
June	1.62	5.81
July	4.69	2.65
August	1.00	2.99
September	4.90	3.00
October	3.88	1.97
November	2.65	2.75
December	2.47	to the 18th 1.43
—	29.04	

With such widely-differing depths of rain, we need hardly add, how very interesting to the farmer is the proportion of these varying amounts of rain-water which his land-drains have to conduct away! This has been carefully determined on different kinds of soil—as on the chalk formation of Hertfordshire, by Mr. Dickson and Mr. Parkes (*Jour. Roy. Ag. Soc.*, vol. v., p. 151); on the limestone formation of Yorkshire, by Mr. C. Charnock (*Ibid*, vol. x., p. 516); and on the London Basin clay and the gault, by Mr. J. B. Denton (*Ibid*, vol. xx., p. 273): and, in the course of these valuable observations, both Mr. Parkes and Mr. J. B. Denton had their attention drawn to several curious effects produced by the removal of the land-water on the temperature of the soil.

The rainfall in Hertfordshire, during eight years, is given by Mr. Parkes in the following table, in tons. By this record the farmer will see how much the relative evaporation and filtration of the rain-water varies at different seasons of the year, and, as might be reasonably concluded, its annual amount also; and he will note that, in practice, almost all the filtered portion must either be removed by drainage, or will remain as land-water, dissolving the saline matters, and in several other ways impairing the fertility of the soil:

	April to Sept., incl.		Oct. to March, incl.	
	Filt.	Evap.	Filt.	Evap.
1836 ..	212	1,023	1,574	330
1837 ..	10	982	693	452
1838 ..	12	1,082	855	393
1839 ..	263	1,500	1,246	159
1840 ..	—	980	829	362
1841 ..	—	1,544	1,437	269
1842 ..	131	1,099	1,059	387
1843 ..	100	1,822	720	538
Mean..	91	1,192	1,052	360

Of the several injurious effects of leaving the soil soaking in water, the lowering of its temperature must be regarded as one of the chief. The different temperature of a drained and the adjoining undrained soil, was ascertained by Mr. Parkes on another kind of land—viz., the deep peat of Chat Moss, in June, 1837 (*Ibid*, vol. v., p. 141). He ascertained that, although the constant temperature of the natural bog, surcharged with water from 12 inches to 30 feet, was 46 deg., and the thermometer planted in the same substance at 7 inches deep constantly indicated 47 deg., yet that in a portion of the same bog, well drained and deeply stirred, at a depth of 31 inches, it indicated a maximum temperature of 48½ deg., having gradually gained 2¼ deg.; and that in such well-prepared soils the action of the atmosphere is much more considerable and rapid than is commonly believed, is shown by the observation made during the same valuable experiments, that, although the temperature of the natural, unstirred soil at a depth of 7 inches, was only 46 deg., yet that the mean temperature during 36 observations of the stirred and drained soil was 10 deg. higher, and that after a thunder-storm it

rose to 66 deg. The following is the result of their observations:

	Temp. of Atmosphere in Shade.	Time of Observation.	Depth below Surface, in Inches.			
	Deg.		31.	25.	19.	13.
June 10 ..	70.0	9 A.M.	46.10	48.2	50.0	53.0
15 ..	60.4	9 A.M.	47.25	48.6	50.8	53.0
17 ..	67.0	9 A.M.	48.0	50.0	52.8	55.6

We have here, as Mr. Parkes observes, satisfactory evidence that the accession of heat was solely derived from meteorological agency—that is, from action on the surface, and not from the substratum, as the latter possesses invariably a lower temperature, which must have tended to diminish, rather than to increase, the heat finally acquired by the worked bed.

It is evident, indeed, from these and other observations, that in the month of June rain-water carries down heat, and raises the temperature of the subsoil; whilst the loss of heat by the strata nearer the surface is quickly restored by the sun's rays. And another important effect is also observable in all soils properly prepared to receive heat and water, and permit their descent—viz., that the transmission of accessions of heat downwards continues during the afternoon of the day, and throughout the night, whilst the superstrata (but chiefly from 7 inches upwards) are losing some amount of their heat by conduction upwards and radiation. Such is the influence of good and deep drainage and ploughing upon the temperature of the soils thus improved. But the benefit does not end there: others follow from those operations—advantages which were thus well described by the late Professor Johnston ("Chem.," p. 110): "Vegetable matter becomes of double value in a soil thus dried and filled with atmospheric air. When soaked in water, their vegetable matter either decomposes very slowly, or produces acid compounds more or less unwholesome to the plant, and even exerts injurious chemical reactions upon the earthy and saline constituents of the soil. In the presence of air, on the contrary, this vegetable compound decomposes rapidly; produces carbonic acid gas in large quantity, as well as other compounds on which the plant can live; and even renders the inorganic constituents of the soil more fitted to enter the roots, and thus to supply more rapidly what the several parts of the plant require."

Let us next refer to the limestone soils of Yorkshire. Here we have on record the observations of Mr. Charnock, of Holmfield, near Ferrybridge (*ibid*, vol. x. p. 516). This Journal was kept during the six years from 1842 to 1848. The following table gives a digest of the results obtained in inches:—

	1842.	1843.	1844.	1845.	1846.
The total amount of rainfall was	26.11	24.49	19.0	28.18	25.24
The evaporation from the soil, when saturated with water, was	30.02	31.19	87.85	31.09	33.28
Ditto when drained	21.56	20.11	15.40	23.26	18.30
The filtration from the soil, through a drain three feet from the surface, was	4.55	4.28	3.60	4.92	6.76

If we examine the clay soil drainage waters, and the effect of their removal from the soil, similar results are obtained.

Mr. J. B. Denton found the temperature of the drained soils, at Hinxworth, at a depth of 18 inches from the surface, was commonly two or three degrees higher than the surrounding atmosphere, and about two degrees higher than that of the undrained soils. One observation of Mr. Denton I have not elsewhere met with. He says, "A remarkable proof of the influence and penetration of atmospheric changes through the soil to the depth of the drains, is to be seen in the fact that all the outlets discharged an increased quantity of water on the 6th of March and 22nd of April without any fall of rain on the surface, it being observed on each occasion that a very considerable fall of the barometer had taken place within the previous twenty-four hours."

From the following table, constructed by Mr. J. B. Denton, from the results obtained by him in the drainage of the Hinxworth estate of Mr. Cluttbuck, several other useful facts may be gleaned. It shows the rainfall in inches, and in gallons per imperial acre, from Oct. 1, 1856, to May 31, 1857, and how many of these gallons of rain-water found their way into the drains from several outlets. In my abridgment of the tables of Mr. Denton I shall give only the quantities of water delivered from two drain outlets, viz., Nos. 7 and 15—the first delivering the water draining from fields composed of the lower chalk, mixed with clay, gravel, sand, mixed with gault; the last, gault clay, with lime infiltrated.

	Rainfall.		Discharge from Outlets.	
	Inches.	Gallons.	Gallons. No. 7.	Gallons. No. 15.
October....	1.645	37,215	12,910	—
November..	1.630	36,872	27,000	330
December..	1.235	27,935	30,135	5,825
January....	2.333	52,775	43,855	31,803
February ..	.192	4,345	27,360	9,060
March	.820	18,547	8,415	3,310
April.....	1.440	32,566	6,698	6,183
May	.750	16,967	4,177	3,418
Total	10.045	227,220	160,550	59,931
Difference between the rainfall and the discharge from drains			66,670	167,289
			227,220	227,220

The mode of draining both the mixed and clay soils of Hinxworth is thus described by Mr. Denton—

"The mixed open soils were drained by occasional and wide parallel drains (from 4 to 8 feet deep), sufficient to discharge the rainfall and relieve the pressure of subterranean water passing through the soil from the higher grounds to their natural outfalls, at a cost varying from £1 10s. to £3 10s. per acre. The drains in this description of soil were reduced to a minimum in number, on the principle that any excess of work beyond that sufficient to remove excess of wetness would be a waste of outlay; whereas in the gault clay soils—which were drained uniformly by a parallel arrangement of drains 25 and 27 feet apart, 4 feet deep, at a cost varying from £5 10s. to £6 10s. per acre—the re-

verse principle governed the operations, the number of drains being increased to a maximum consistent with economy; the object being twofold—not only to remove excess of wetness, but to promote an uniform aëration of the mass of clay above the level of the drains, so as to counteract as much as possible its absorbent and retentive nature.

“The total net cost of draining the 800 acres was £3,357 10s., giving an average cost per acre of £4 4s.”

And the reporter had the satisfaction of adding at the close of his valuable paper that the Clay-land Farm had just been let, on terms securing a full return for the capital expended in draining, and other improvements.

The recorded comparative movement of the water in the mixed and the clay soils of Hinxworth are certainly not the least interesting portion of these observations. As might be reasonably expected, Mr. Denton tells us that the discharge from the mixed open soils was much more regular than from the clays. The quantity of water discharged by the comparatively few drains of the freest description of soil during the period of the experiments was 160,920 gallons per acre, out of 227,240 gallons which the rain-gauge showed fell upon every acre drained, while the quantity discharged from the numerous drains of the clays was only 59,936 gallons per acre.

The steady discharge of more than 1,000 gallons per acre per diem from the mixed open soils during the winter—when evaporation is so much less than during the summer—is a fact of considerable importance, when considered in relation to the wide extent of similar land requiring drainage. It will be observed, too, that after the autumn rains had completely replenished the absorbent demands of the clays, a large proportion of any succeeding rain was immediately discharged by the under-drains. There was a fall of rain at Hinxworth in October, 1856, of 1·645, and in November of 1·630, equal together to a supply to the soil of 74,087 gallons, or 330 tons of water per acre. The drains just began to trickle on the 27th of November, after a fall of half an inch of rain (·540). The test holes in the land showed that the soil was rapidly feeding itself, and that the water-level was rising, but had not reached the level of the drains. On the 12th December the outlets were running 160 gals. per diem. per acre, after frequent rains in the early part of the month, of less than a tenth of an inch per diem. On the 13th the rain-gauge showed a fall of ·452 (nearly half an inch), and the outlets increased their discharge from 160 to 975 gallons per diem per acre. On the 9th January, 1857, the outlets were running 125 gallons per diem. On the 10th the rain-gauge showed a fall of ·542 (rather more than half an inch), and the discharge from the outlets was increased from 125 to 5,150 gallons per diem per acre. How important, adds the reporter, are these facts, in considering the effect of extended underdrainage on the arterial channels of the country!

The estate of Hinxworth is thus described by Mr. Denton (*Journal Roy. Ag. Soc.*, vol. xx. p. 273)—“It lies at the bottom of the chalk escarpment of the London Basin, and covers a portion of

the lower bed of chalk, the out-crop of the green-sand, and a portion of the gault of the green-sand formation. In several parts a superficial deposit of drifted gravel and sand overlies the older beds. The green-sand separating the chalk from the gault is very thin, and if collected in a distinct layer, would not exceed three inches in depth in its thickest part. The gault has gained a siliceous character where it comes immediately in contact with the green-sand. It has also imbibed a calcareous quality by an infiltration of the chalk through the green-sand into its bed; for a wide breadth, however, the gault is denuded, and there, although the green-sand is absent, a very considerable infiltration of lime has taken place, which I presume may be accounted for by the fact that the chalk escarpment rises in almost cliff-like shape immediately at the margin of the gault, and any submersion of the gault has necessarily imparted to it the character of its more prominent and overwhelming neighbour. The nature of the soil is ever of paramount importance in considering the results of any reported drainage operations.”

The following are the analyses of the soils of Hinxworth by Professor Way:—

OF THE LOWER CHALK AND MIXED DRIFT.

Moisture and organic matter	.. ..	3·27
Sands and clays	.. ..	24·37
Silica soluble in acids	.. ..	1·23
Oxide of iron	.. ..	1·14
Phosphate of lime	.. ..	0·92
Sulphate of lime	.. ..	0·76
Carbonate of lime	.. ..	68·31
		106·00

OF THE GAULT (AT 24 INCHES DEEP).

Moisture and organic matter	.. ..	5·01
Sands	.. ..	0·66
Clay	.. ..	63·26
Carbonate of lime	.. ..	31·07
		100·00

OF THE GAULT (AT 42 INCHES DEEP).

Moisture and organic matter	.. ..	4·28
Sands	.. ..	0·34
Clay	.. ..	62·97
Carbonate of lime	.. ..	32·41
		100·00

It is from such careful practical observations that the young farmer will derive the most useful information as a guide to his drainage operations. It is not, it is true, the landholders of the light-soil districts of our island that have to encounter the expense of land-drainage. The question is of but very inferior interest to the skilful agriculturists of the Norfolk sands, the Suffolk crag, and of the great southern chalk formation of Surrey, Hants, and Dorset; but it is of great and enduring importance to the farmers of our extensive clay lands.

It will, we may all very easily discern, be long of increasing importance to the cultivators of such retentive soils. It is to them, in fact, that we must now look for that supply of animal food needed to support a rapidly increasing population; and the greater the advances are made in converting such heavy-soil holdings into stock farms, the more desirable it becomes to render their drainage more complete.

LONDON, OR CENTRAL FARMERS' CLUB.

THE ANNUAL DINNER.

On Tuesday, Dec. 11, the annual dinner of the Club took place at Radley's Hotel, Blackfriars, and was attended by about 80 gentlemen. Mr. L. A. Coussmaker concluded his round of duties as Chairman by presiding. He was supported right and left by Lord Berners, Mr. H. Trethewy, Mr. Owen Wallis, Mr. B. P. Shearer, Mr. Fisher Hobbs, Mr. James Wood, Mr. Robert Smith, Mr. Jonas Webb, Mr. Cuthbert Johnson, Mr. James Howard, Mr. N. G. Barthropp, Mr. J. Bradshaw, Mr. T. Congreve, Mr. C. Howard, Mr. B. E. Ward, Mr. J. Druce, Mr. H. Cheffins, Mr. W. Cheffins, Mr. W. Moss, Mr. E. Little, Mr. Bidwell, Mr. Wilsner, Mr. John Bell, Mr. Cressingham, Mr. Bailey Denton, Mr. T. Knight, Mr. R. Cobb, Mr. G. Cobb, Mr. T. Solly, Mr. Scott Burn, Mr. Sidney, Mr. Dumbrell, Mr. E. Edmonds, Mr. W. Tuxford, Mr. Butcher, Mr. E. B. Waite, Mr. Ibbott Mason, Mr. J. Coleman, Mr. Child, Mr. Child, jun., Mr. Harrison, Mr. H. Rayner, Mr. Braginton, Mr. R. Marsh, Mr. Purser, jun., Mr. Revis, Mr. Brown (Tring), Mr. J. Parkinson, jun., Mr. Eager, Mr. Stronghill, Mr. W. C. Spooner, Mr. Christie, Mr. Cumberland, Mr. Brown (Compton), Mr. Anderson, Mr. Hobson, Mr. Skelton, jun., and Mr. Eaton. Mr. Spencer Skelton, as President-elect, occupied the vice-chair; and Mr. Corbet, the secretary, that at the companion table.

After the usual loyal toasts,

The CHAIRMAN proposed "The Army, the Navy, and the Volunteers," coupling with the toast the name of Mr. James Wood. It had, he said, often been remarked that their nation was not a military one; but the rapid spread of the volunteer movement showed that that assertion was not well founded. Upwards of 100,000 men had come forward spontaneously to defend their country, and the result was that the national defences were in a most satisfactory state, and the nation relieved from all apprehension (cheers).

Mr. Wood, on rising to respond, did so simultaneously with thirteen other volunteers among the company assembled. After speaking of the success of the services of the army and navy, he said he could have wished that some other person had been called upon to respond to the toast on behalf of the volunteers. At his time of life it was not at all probable that he would ever make a first-rate soldier; but, nevertheless, as an Englishman, he had felt it his duty to come forward and take part in the great movement in defence of his native country (cheers). As regarded those who shrank from the sacrifice of time involved in what they were pleased to call playing at soldiers, and sneered at others for not taking the same view, he must say that he did not envy their feelings (cheers). It was, undoubtedly, a very serious matter to learn one's drill properly (laughter); it was no trivial matter to require those who acted merely from a sense of duty, and without any compulsion, to keep their mouths shut, and to stop in their places for a considerable period. But on the other hand, the volunteers had the proud satisfaction of knowing that they were doing their duty, and he trusted that would be a sufficient motive for them to persevere (cheers).

The CHAIRMAN then proposed the toast of the evening, "Success to the Central Farmers' Club." He said, in rising to perform that duty, he was sustained, under the

sense of his inability to do it justice, by the knowledge that the Club was then in a prosperous condition. Its prosperity had of late been gradually increasing, and he was proud to say that it was never before in so good a position as it was at that moment (cheers). The funds were in a very satisfactory condition; and there was a greater number of members than ever appeared on the list before (renewed cheers). Still, he must say, he could not understand how it was that a Club like that had not increased more rapidly than it had done (Hear, hear). The only explanation of it was, that there were local clubs having local interests scattered through the country, and that there was some difficulty in farmers congregating together for common purposes in a central institution like that. Railways had, however, so changed the face of the whole country, that many a farmer who used to come to London only once in the course of three or four years, if indeed so often, now found himself in the metropolis half-a-dozen times a year. Where could the farmer, who came here on business, find more congenial or profitable society than at the Central Farmers' Clubhouse? (Hear, hear). There an agriculturist from the North or the East might meet one from Cornwall; and the interchange of ideas and the relation of experience might lead to mutual advantage (Hear, hear). For himself, he would remark, that having joined that Club a very few months after its formation, he had in consequence made the acquaintance of many of the leading agriculturists of the day connected with various parts of the country; and the result was, that by mingling with them in conversation he had gained a great deal of useful information. He took great interest in everything connected with the Club; he valued it more highly than he had ever done; he trusted that now that railway communication was so rapid and extensive, not only England, but even Scotland and Ireland would supply constant accessions of members (cheers).

LORD BERNERS said he had risen, at the request of the committee, to propose the next toast. He must, however, before doing so, express the pleasure which he felt at seeing so many volunteers rise, a short time before, to respond to a toast in which the volunteer force was very properly included—a force which had raised this nation, he did not hesitate to say, to a higher position in the eyes of other nations than it ever occupied before. (Cheers.) He was delighted to hear the sentiments expressed by Mr. Wood, and he had no doubt that they were shared by farmers generally. He had often observed that there was a general disinclination among farmers as well as others for statistics. It had, however, struck him, in reflecting on the immense losses which farmers had sustained through epidemics among cattle, sheep, and pigs, that they might collect and circulate statistics of the number of animals that had died of different diseases, discriminating between those who had died under medical treatment and those who had died from being left to themselves. He mentioned this, because he felt satisfied that if in the early stages of disease proper remedies were applied an immense deal of loss would be avoided. At the meeting of the Royal Agricultural Society at Canterbury he took the liberty of re-

minding those who were assembled at the dinner of the advantage of their being members of that society, inasmuch as when an epidemic had broken out in their neighbourhood they might by applying to the committee in Hanover-square obtain the assistance of the veterinary professor for the expense of his journey. A few years ago he himself received the greatest benefit from that assistance in a case of pleuro-pneumonia among his cattle. He had also received similar benefit with regard to rot among sheep. Having generally from five hundred to a thousand sheep on his farm, it might well be imagined that he must have suffered a good deal during this wet season; but on inquiring the other day whether there were any lame sheep in the flock, he was told that there was not one. This was the result of his having followed the directions of Professor Simonds, first applying lunar caustic, following that up with tincture of myrrh, and avoiding all hot applications. (Hear, hear.) A hot application might do good for a moment; but it must generally be repeated, and the result was that it caused inflammation and prevented a cure. He would recommend others to adopt the same treatment that he had done. He had not been able to attend any of the discussion meetings during the present year, having unfortunately always been engaged in "another place" at the time when they occurred. He would therefore take that opportunity of suggesting that although protection had now been done away with, it might be well to consider whether there could not be a better mode of taking the corn averages. He was also of opinion that the important subjects of weights and measures ought not to be overlooked by farmers; and to this he would add, that he thought it was impossible to impress too deeply upon the agriculturists of the kingdom generally the absolute necessity of having proper analyses of artificial food and manures. (Hear, hear.) He would now, in conclusion, propose a toast which he was sure would be received with the greatest cordiality, viz., the health of their chairman. (Loud cheers).

The toast having been drunk with enthusiasm, the Chairman briefly returned thanks.

Mr. H. TRETHEWY said he had been requested to propose "The Royal Agricultural Society of England, the Highland Society of Scotland, and the Royal Agricultural Society of Ireland;" to which he would venture to add "The Bath and West of England Agricultural Society," the operations of which were very beneficial to agriculture (Hear, hear). As a club they were under deep obligations to these societies, which had the same object in view that they had, namely, the improvement of agriculture. They lived in an age of progress and invention, and agriculture must not stand still. It had not stood still. Great as had been the advance of the arts and sciences during the last thirty years, the progress of agriculture had not been less remarkable; and no one who was at all familiar with the subject could doubt that from the great results already attained agriculture was largely indebted to the societies he had named (Cheers.) These societies were all engaged in the same work; they were all auxiliaries in the field of agricultural improvement. They devoted their time and their funds to the improvement of cattle and of implements, objects of very great importance, and who would say that their efforts had not been eminently successful? They had only to look at the breeds of cattle, and the implements of the present day, and to compare them with the cattle and implements of twenty-five years ago, to see how much agriculturists were indebted to these institutions. He would

now propose the toast, only adding that he was happy to see an influential member of the Bath and West of England Society was present that evening; he referred to Mr. Robert Smith (Cheers.)

Mr. FISHER HOBBS, in replying on behalf of the Royal Agricultural Society, said he regretted that that duty had not been undertaken by the noble lord (Lord Berners); but as a humble individual, who had been at no inconsiderable pains to assist the progress of agriculture, he felt proud of that recognition of the claims of the society which he had the honour to represent. He was confident that the practical farmers of this country would, whether they belonged to that club or not, always respond heartily to a toast which was virtually "Prosperity to the Agriculture of the United Kingdom" (Hear, hear.) He agreed with Mr. Trethewy, that to those great societies which were included in the toast, agriculture was greatly indebted for the progress it had made during the last quarter of a century. As regarded the Royal Agricultural Society, he could assure those who listened to him that in the Council, however much the members might differ as to the best mode of proceeding, they had all, whether they were landowners, occupiers of the soil, mechanical engineers, or men of science, but one great object in view, namely, the advancement of the agriculture of the country. No doubt there had been a feeling at times that improvements had not been carried out as rapidly as it was desirable they should be. Still the object of all had always been to advance the great cause of agricultural improvement; and he was sure that when suitable persons had been selected to represent the farmers of England, whom he did not wish to see preponderating, but only exercising their proper influence in the Council, the result would be that there would be a great increase in the number of members, and that the Farmers' Club, the Royal Agricultural Society, the Highland Society of Scotland, the Royal Agricultural Society of Ireland, and other societies of a kindred character, would go hand-in-hand in promoting the progress of agricultural science. He would observe that he anticipated for the Royal Agricultural Society a splendid meeting at Leeds next year. Everything had been done that the Council could do to enlarge the prizes, and to afford abundant accommodation for stock. There were one or two things which would, he thought, especially tend to make the Leeds Exhibition a successful one. In the first place, with regard to implements, the society had arranged that the trial of the steam cultivators should precede the exhibition, in order that, if possible, agriculturists might be enabled to learn which would be the best cultivators for them to purchase and to use. They might not succeed in pleasing all parties concerned, but he could assure them it was the earnest desire of the implementing committee that steam cultivators should at all events have fair play (Hear, hear.) Another important feature would be the offering of a prize of 100 sovereigns for the best thorough-bred stallion for getting hunters and strong useful horses. Hitherto the Society's horse show had not been of that high character which might be looked for in the case of a great national society, one or two provincial shows having in that respect been equal or superior to their own, but he anticipated that next year the show would include an excellent display of Clevelands, thorough-breds, and Suffolks, and would as a horse show prove the greatest attraction that had ever been witnessed in the British Isles. In conclusion, he would say, and he was sure Lord Berners would bear him out in so doing, that if any of the farmers of England wished to represent their views to the Council on

any important subject, they need not fear that their views would not receive due attention.

Mr. ROBERT SMITH, in returning thanks for the Bath and West of England Society, remarked that the origin of that society dated as far back as 1777, and he believed that it had rendered good service to agriculture. He had the honour to be on the Journal Committee of that society, and had been placed there in order that he might do his best to secure a useful and practical character for whatever was published. His own attention had been especially devoted to stock. Implements he left almost entirely to others who were better acquainted with them, with the exception that he was anxious that implements should be provided which would be available not merely for the largest farmers, but also for such as occupied comparatively small farms. (Hear, hear.) As regarded the discussion of the previous evening, he could not help remarking that those who were called labourers were not the only persons who might be so designated. Farmers laboured as well as those whom they employed, and they had to labour to provide the capital out of which the wages of labour were paid. (Hear, hear.) He concurred in the opinion that education was most important in reference to the condition of the labourer. The Howards and Ransomes had now got into full play with their implements; and he would say to agriculturists, educate your labourers so that their mental powers may be brought to bear on the steam-engine as well as the plough. (Hear, hear.)

Mr. CONGREVE proposed the next toast, viz., "Success to

the Smithfield Club." He said, while the Royal Agricultural and other societies were endeavouring to diffuse pure breeds, the Smithfield Club devoted special attention to the feeding of these breeds, bringing them to early maturity, with the view of providing moderately cheap meat for the working population of the country—an object, of course, of very great national importance (Hear, hear). He was glad to hear that the two Clubs were not to clash, and that the injudicious motion made last year, to bring forward the dinner of the Smithfield Club to the same day as that of their own Club, had been wisely abandoned. With the toast he would couple the name of Lord Berners, the new President of the Smithfield Club; and he hoped that under his lordship's presidency the Club would continue to prosper.

Lord BERNERS, in replying, after deploring the great loss which the Smithfield Club had sustained in the death of the Duke of Richmond said that, having attended the meetings of that Club for upwards of thirty years, he had a deepened conviction of their great public utility.

Mr. JAMES HOWARD proposed "The Local Farmers' Clubs," coupled with the name of Mr. Spooner, by whom the toast was acknowledged at some length.

Mr. Denton gave "The Committee of Management," acknowledged by Mr. Shearer; Mr. Parkinson, "The Secretary," responded to by Mr. Corbet; and Mr. Jonas Webb, "The Visitors," for whom Mr. Eaton, a farmer from the Cape of Good Hope, returned thanks.

The company separated at an early hour.

GENERAL DRAINAGE AND OUTFAL BILL.

A public meeting of landowners, farmers, and others was held Wednesday, December 12, at the Hanover-square Rooms, "to consider the necessary steps to be taken to secure legislative facilities for the improvement of outfalls and arterial drainage generally." The Earl of Romney was called to the chair; and there were also present Sir J. B. Shelley, Bart., M.P., Sir J. Heron Maxwell, Bart., Sir John Tyrrell, Bart., Mr. Langston, M.P., Mr. Fisher Hobbs, Mr. Spencer Skelton, Mr. Robert Smith, Mr. Smith (of Rasen), Mr. Grantham, Mr. J. Clutton, Mr. Hewitt Davis, Mr. Algernon Clarke, Mr. J. C. Morton, Mr. H. Corbet, Professor Voelker, Mr. J. Wells (Boothferry), Mr. H. Cheffins, Mr. J. Moore, Mr. Howard Reed, Mr. Hobson, Mr. Bailey Denton, Mr. H. P. Jones, Mr. J. Webster (Pea-kirk), Mr. Hall Dare, Mr. E. B. Waite, Mr. R. Marsh, Mr. T. Scott, Mr. Thorold, the Rev. Mr. Clutterbuck, &c., &c.

The CHAIRMAN said, that the importance of the subject had induced him at once to accept the invitation to preside over the meeting. They were called together to consider what steps should be taken to promote an improved system of sewerage and drainage throughout the kingdom. This subject had long occupied attention, but the immense quantity of rain which had fallen during the present summer and winter, and the floodings consequent thereon, had forced the evil more strongly upon their notice. The principle of taxing land for the purposes of sewage was very old. Nevertheless it existed only partially, and in comparatively few districts. In those districts, however, the powers given by the local acts were after all insufficient and inconvenient, while many other parts equally requiring improvements in the great arteries for carrying off water never had powers of that description given to them, because the necessity did

not exist for them in former days. But in consequence of the great exertions made of late years in drainage, land now delivered itself at once from water that formerly retained it, the water soaking into the earth, and therefore it did not then signify what impediments might have existed to the uninterrupted flow of water. Under these circumstances certain gentlemen considered it of the utmost importance to organise measures with a view of getting a bill passed for the whole kingdom, giving all the necessary powers for the improvement and extension of arterial drainage (Hear, hear). Of course, powers would have to be taken with regard both to the large and small arteries, as on the condition of each depended the effectual carrying out of any complete system. Objections were made by some persons to this sort of legislation on the ground that it was an interference with the rights of private property; but anyone who had considered the subject knew that property should never be held by any person so as to be an obstruction to public interests, and that private rights must give way to great public convenience (Hear, hear). It was so now, and had been so almost from the very beginning. In ancient times, men held their land by virtue of certain duties which they had to perform, perhaps at great personal inconvenience. For instance, by their tenure they were called upon to defend the kingdom against all invaders; and now a man could not so deal with his land as to prejudice or to cause nuisance to his neighbours or the public (Hear, hear). With regard to the outfall of water on land, a man, by neglecting his duty, might do the public a great injury. Supposing he had a stream running through his estate, and he refused to allow his neighbours above to come upon it to improve the outfall which remained checked,

the water from a higher level would accumulate on the surface of the land, and the drainage of a whole district might be prevented. Therefore, no reasonable person, on reflection, could say that any objection could properly be made to promote such a measure as he had indicated. It was in accordance with English law that land should be taxed to carry out these necessary improvements. Every one knew of instances of the kind. In his own county there were the Romney Marshes, with regard to which the principle had existed from time immemorial, and he need scarcely mention the case of the Bedford Level, with which all were acquainted. Landowners had no more right to object to the making of proper watercourses through their estates than they had to prevent a highway or a railway over them being constructed (Hear, hear). Nothing was more important to a country than the development of its agriculture, and it was now generally admitted that nothing was more destructive to agriculture than the prevention of a good system of drainage (Hear hear). These were the general grounds on which he thought the course suggested ought to be taken. In 1852 a bill was presented to parliament on the subject, but it did not pass, and since then the evil it was designed to remedy had gone on steadily increasing, owing to the improvements in drainage. Parliament and the government had greatly assisted in bringing about that state of things, for while doing an undoubted good they had overlooked the consequences to which it would lead. Under acts of parliaments the public money was lent to landowners to enable them to drain their lands, and bills had been passed empowering companies to afford facilities to them for a similar purpose. Exactly the same thing, in fact, had been done with regard to land which was done respecting the sewage of London. Every facility was given for conveying sewage to the river, but what would become of it when it got there was never thought of (Hear, hear). There were great efforts to deliver lands from water, but no provision whatever had been made to get rid of that water after it had accumulated, although that was a matter of the utmost importance (Hear, hear). He supposed that some gentleman would be prepared to recommend the adoption of some specific course for attaining the object they had in view; and probably one of their proceedings would be the appointment of a committee (cheers). He had received a letter from the Dean of Christ Church, Oxford, which, with the permission of the meeting, he would read. It was as follows:

"Christ Church, Oxford, Dec. 11, 1860.

"My Lord,—I regret exceedingly that duties to be performed in Oxford make it impossible for me to attend the meeting over which you are to preside to-morrow. No place can suffer much more than Oxford from obstructions to the free outfall of the flood waters. For nearly a year, with the exception of an occasional fortnight, our valley has been under water. The University has already agreed to a petition to parliament to remove certain legislative obstacles to free drainage. The city will, I doubt not, take the same course. And I trust the landowners, whose property has suffered so terribly during these months of flood, will join us. I hope that the Government will be prepared to introduce a general bill to remedy the grievous evils induced by local acts, artificial instructions and all other causes not removable without legislative interference.—I have the honour to be, my lord, your obedient servant,

"HENRY G. LIDDELL, Dean of Christ Church, Oxon."

Sir H. VASOUR said: If the existing statutes relating to the drainage of land have been found comparatively of little use in ordinary seasons, they have proved quite insufficient in this extraordinary year. It must be obvious to

persons even little conversant with agricultural operations that the present must be a disastrous year to the farmer; but it is impossible for the resident in a town to realize the state of the country; nor can the inhabitant of a hilly or even an undulating district form a correct notion of the extent to which the low arable grounds are injured. The occupant of a hill farm has the rain of to-day, and perhaps of yesterday, to contend with; but the lowlander has that of to-day, of yesterday, of last week, and the week before last, to grapple with. In the month of October, I asked an old man whether he ever remembered a season like the present. He said, "Yes, seventy-five years ago." The ordinary amount of rain at Chiswick in the twelve months is 24 inches: the quantity fallen this year up to this day, omitting decimals, is 29; but, after all, it is not so much the excess of rain that is so injurious to farm produce, as the length of time the water remains in the soil. The earliest statute bearing upon our subject is the 6th of Henry VI. (A.D. 1427), authorising the Chancellor of England to grant a commission for ten years. A number of statutes of the same kind were passed from time to time in succeeding reigns. The preamble to the 23rd of Henry VIII., cap. 5, after the first few words, has this sentence: "Nothing earthly so highly weighing as the advancing of the common profit, wealth, and commodity of his realm," in which patriotic sentiment the subjects of her present Majesty doubtless will concur. The most recent of these acts is, I believe, the 3rd and 4th of William IV., cap. 22. A commission has lately been applied for under these acts, to take effect in a district with which I am acquainted, and considerable benefit might arise did not one or two districts under the jurisdiction of local acts intervene between a portion of the level and the natural outfall, a great tidal river. A commission is, I hear, in force in Lincolnshire; with what success I do not know. This brings us near Lord Lincoln's act, upon which no doubt many persons are prepared to offer a more competent opinion than myself. If, however, all these acts were in themselves efficient, large tracts of country would remain in their present miserable plight, from the operation of local acts which remain untouched by any general statute. Until, therefore, these local acts are specially improved, little general good will be effected. I will now endeavour to show how these provincial acts, as I may term them, clash with the imperial. A has an estate, say 35 feet above the sea, which he underdrains, thereby sending an additional quantity of water upon neighbour B's land: a little lower, C, who marches with B, finding himself uncomfortable from the improvements going on above him, asks for an inspection of his estate under the Inclosure Office, and receives a grant, being told to commence "hard all," otherwise it will be a lapse legacy: he succeeds in expending the money, and hopefully waits the result. But now come the troubles—first one tenant presents himself, then another, to complain of bad drainage. B's tenants become clamorous, and A's anxious. These three vexed spirits lay their heads together, and find, to their consternation, they have commenced operations at the wrong end: small thready drains extend in every direction, but the common outfall remains as before, a sluggish, meandering stream, running into a navigable canal, at the junction with which the course of the water is still further impeded by a dam, over which the water flows three feet deep; the local act directing that the said dam should be "pulled up" whenever the water runs more than four inches over it. True, say the trustees, the act says so, but it does not say so to us: this it says to the commissioners who cut the

canal 90 years ago; all we have to do is to keep the dam in its place, and see that you do not take it up. C, not yet discouraged, and thinking his property has, to a certain extent, become a Government security, appeals to the Inclosure Commissioners, who thus reply: "Sir, with every wish to be of service to you, we regret we cannot render you any assistance;" adding, however, subsequently, that C is authorised to inform the trustees they consider it most improper the works should be in the state represented. At this slight ebullition of wrath, the said trustees snap their fingers, and invite C to apply for a mandamus, telling him at the same time that an opinion having been taken some years before, his doing so will be a complete waste of money. I wish it to be understood I do not make personal allusion to anyone; it is the state of the law I wish to draw attention to. We hear much of the damage from game. I will venture to say more injury is caused in a single day from the want of drainage, than from all manner of "four-wheelers" upon our estates during the whole year. Let me, therefore, entreat landowners to defer commencing any important drainage works until an alteration in the law has been made; and let me urge engineers (who have not hitherto had a fair chance) to decline undertaking any work, of the success of which there can be any reasonable doubt. Let the custom of giving pipes or tiles to tenants to be laid upon a hundred different principles, and often upon no principle at all, be abandoned. Draining with a due regard to economy, the only kind of draining to be advocated, is a science requiring a long apprenticeship, and few men become masters of it. If a change in the law be desirable for the great and powerful, it is eminently so for the small proprietor. I behoves us, therefore, to urge the Government to lose no further time in collecting such information as will enable them to prepare a strong, broad measure, and, if possible, one that will work with simplicity; to frame such other acts as they are assured, and find from their own inquiries, are necessary for the improvement of and modernizing certain local acts; and, in fine, as far as practical knowledge, common sense, and a determination to do their duty, under the Divine blessing, will ensure success, put an end to the present ambiguous, unsatisfactory, and wasteful state of things. Let us remind the Chancellor of the Exchequer that at a moment when he is calling upon us for every shilling we can spare, and occasionally for one we cannot—when the rental of half a county, or more, is spent upon a single ship, and the national debt has a tail nearly as long as that of a comet, we cannot afford to be fettered by statutes passed at a period when England was a second-rate power and a wheat-exporting country. Finally, let it not be forgotten by those of our fellow-countrymen who are not so directly interested in the cultivation of land as ourselves, that the greater the share of the public burthens we are enabled to pay, the smaller will their proportion be.

Sir J. SHELLEY entirely concurred in what had fallen from Sir H. Vavasour, but would like to know whether, in the opinion of the chairman and of the meeting, the bill introduced some years ago by Sir W. Miles in the House of Commons was sufficient for the accomplishment of the object in view? If so, he might at once state that it was his intention to give notice, immediately after the reassembling of parliament, of a motion for the introduction of that measure (cheers). The bill in question, after having passed the House of Commons, was rejected by the Lords; but the information and experience which had been gained since 1852 rendered it possible that if such a measure were again submitted to parliament it would meet with the assent of both

houses. Possibly those who convened the meeting had prepared a bill on the subject.

The CHAIRMAN believed that no bill had been prepared, and understood that reference would be made to that of 1852.

Sir J. SHELLEY said the reason why he thought such a bill as had been rejected in 1852 would now be carried was, that circumstances had since arisen which increased the importance of the subject. Drainage, which was then but beginning to attract attention, was now almost general, and it was certainly no exaggeration to say that where amongst the landed proprietary there was one drainer in 1852, there were now 100. One thing he would add, which was that the government had their hands amply filled for the coming session with other matters, and would make every excuse, therefore, to avoid taking up a subject of this kind. If the landowners on both sides of the house agreed in the desirability of such a measure, and would take the matter into their own hands, he had no doubt, from his experience in parliament, that they would succeed. He had no wish to have the conduct of the bill, and would be glad if some member of more weight and influence were entrusted with it.

Sir J. TYRELL pointed out the difficulties which any private member of parliament would have to encounter in taking up a general question of this nature.

Sir H. VAVASOUR then submitted a resolution to the effect "That this meeting considers that a comprehensive public measure of arterial drainage and the improvement of outfalls is highly essential to meeting the requirements of the present advancing state of agriculture." It was the opinion of almost all persons who had considered the subject that such a measure could only be carried by the government, and that government a strong government; therefore he proposed to supplement this resolution by another, viz., "That a deputation from this meeting wait upon the Secretary of State for the Home Department to impress upon him the necessity of the government introducing such a measure at the earliest possible period of the ensuing session."

Sir J. SHELLEY seconded both resolutions.

Sir J. TYRELL said he should like to know what was meant by "arterial drainage?" (Hear, hear.)

Mr. BAILEY DENTON, at the request of Sir H. Vavasour, came forward to give an explanation of what was intended. He said that river reform was included in "arterial drainage;" the power to deal with rivers and all their tributary streams, the clearing away of dams, and, where necessary of mills.

Sir J. TYRELL having expressed himself dissatisfied with the explanation,

Mr. B. THOROLD said he conceived that what was meant was the clearing away of all impediments in the main water-courses or arteries, and the removal of those engineering works erected upon Sir George Rennie's principle for the mere feeding of canals, which that authority declared to be the only purpose rivers were intended to serve.

Sir J. H. MAXWELL deprecated one landowner's acquiring power to enter on another landowner's property, considering it better to leave the matter to be settled by neighbours between themselves.

The CHAIRMAN said the object of legislation was to acquire the power of dealing with those who were not so generous as Sir J. Maxwell supposed all landlords to be.

The resolutions were then passed and carried.

Mr. J. CLUTTON said, having been attached to the Drainage Commission in Ireland, he could say from experience there, with the utmost confidence, that if the proposed mea-

sure were carried, the people in the districts affected by it would be enormously benefited. Thousands of acres of land in the Valley of the Thames, now worth only 10s. per acre, would, if such a measure were carried into full operation, become worth 50s. There was scarcely a valley in England that did not require a remedial measure of that kind (Hear, hear).

The following gentlemen were then appointed to act as a

committee, and to form the deputation to the Home Secretary:—The Earl of Romney, Sir John Shelley, Sir Henry Vavasour, Mr. John Clutton, Mr. Heathcote (Connington Castle), Mr. Langston, Mr. Bailey Denton, Mr. Algernon Clarke, Mr. Grantham, Mr. Fisher Hobbs, and the Rev. J. Clutterbuck.

Thanks were then voted to the Chairman, and the meeting separated.

RIVER REFORM.

ARTERIAL DRAINAGE AND RIVER REFORM has now a prospect of coming really before the public mind in a tangible shape. The Committee appointed in Hanover Square to take measures for advancing the views of that meeting and to go as a deputation to Her Majesty's Secretary of State for the Home Department, were received by Sir George Cornwall Lewis, on Friday, Dec. 21; and, from what we learn, the following is the upshot of this rather auspicious interview. Out of the eleven gentlemen appointed on this Committee, two only were unavoidably absent; one being the Earl of Romney, whose sound judgment and clear method of enunciating the complaints and desires pertaining to the cause, were largely depended upon for placing the views of the drainers ably and fully before the Home Secretary; while the other absentee was the Rev. J. Clutterbuck, a man experienced in relation to that worst of all mill-and-navigation drowned district, the valley of the Thames and its feeders. The gentlemen present were—Sir John Villiers Shelley, Bart., M.P., who introduced the deputation; J. H. Langston, Esq., M.P.; Sir Henry Vavasour; Mr. Heathcote; Mr. W. Fisher Hobbs; Mr. John Clutton; Mr. John Algernon Clarke; Mr. J. Bailey Denton, C.E.; and Mr. K. B. Grantham, C.E., Hon. Secretary to the Committee. The interview was not very protracted, but sufficient time was given for informing Sir G. Lewis of the extent to which landowners are now damaged by their legal inability to command better outlets for drainwater—the loss to the community involved in the neglected or impeded condition of river mill-streams and simple water-courses—and the amazing benefit in all cases to agriculture, in many cases to navigation and mill property, and in general to the sanitary state of the population of town and country, which would follow a comprehensive general measure of relief, permitting and enabling both district or individual proprietors to readily amend natural and artificial channels for waters.

Sir Henry Vavasour read a short general statement in reference to the point.

Sir John Shelley showed the necessity existing for an immediate remedy for the improvement of minor drains, and the obtaining of outfalls through intervening properties, as well as for a more comprehensive means for large streams.

Mr. Langston stated the case of the city of Oxford, showing that not mere landowners only, but townspeople and many other interests are concerned, and should be considered in any general measure.

Mr. J. Bailey Denton replied to various inquiries of Sir George Lewis, explaining what was meant by the large question of the consolidation of all district drainages under one central control, so as to supersede the innumerable existing bodies of trustees, commissioners, &c.—what was meant by a general measure for enabling the majority in any new district to bind a

dissenting minority to assist, and to deal with mills, navigation, &c.—and what was meant by a minor measure for the immediate wants of underdrainers, so that a water-course might be obtained through the land of intervening owners without the obnoxious proceedings prescribed by Lord Lincoln's Act of 1847, and without the burden of having to pay compensation (under the Land Clauses Consolidation Act) before the work can be begun.

Mr. John Algernon Clarke explained that there were two entirely separate and distinct subjects now brought before the Government. One was the passing of an Act for enabling individual or associated proprietors to obtain a new or better outlet for drain works through one or more estates intervening between them and a public watercourse, which might be secured by an amendment of Mr. Ker Seymour's Bill of 1854, with the provision that the operation of the Land Clause Consolidation Act should be suspended where the compensation required does not exceed £100. The second object was the obtaining of a comprehensive General Act to take the place of separate local acts in future district drainage, enabling proprietors of land and also proprietors of mills and canals, the inhabitants of towns, and any other water rights and interests, to combine for mutual improvement of their respective properties, or the major interests as compared with the less important, as the case may be—giving a certain majority power to bind the minority to assist, and establishing a local board in each district for the conservancy of the works. In many districts land was damaged to a greater amount than the value of the mills or navigation; in other districts the navigation or the mills, the reservoir, fisheries, or ornamental waters were of more consequence than the small fringe of meadow alongside the stream; and hence an Act, like the Earl of Carlisle's, framed simply with a view to the drainage of land, could not meet all the evils and necessities of the present condition of the river. Mr. Clarke said that no general Act could be framed which would be satisfactory to the country unless full knowledge was first collected as to the nature and relative importance of the various interests now existing in different localities; and that while the smaller measure of temporary relief would be at once acceptable, a Government inquiry was necessary, in order to furnish a base for the greater legislation.

Mr. W. Fisher Hobbs described the great evils which agriculturists were extensively suffering in consequence of the present excessive downfall, while our outfalls remained without possibility of amendment. He instanced the losses of hay, of corn never sown, of animals by disease induced by the floods—stated his own experience, how he had cut half a mile of open drain through a neighbour's property, because fortunate enough to obtain his permission to do so; and though that owner was benefited more than himself, he could neither demand any part of the expense nor secure the

perpetual maintenance of the new outfall. He knew that many millers were anxious to have an improvement of mill-streams, on the principle of a compensation, consisting of a substitution of steam-power for the water.

Mr. Heathcote added some particulars as to the middle level drainage in the Bedford Level; and a conversation followed, in which Mr. Grantham joined; while Mr. John Clutton gave some particulars as to the wretched state of the Thames' and other valleys, and the possibility of extraordinary improvement in the value of property from river improvement.

In the course of the interview, Sir George Lewis stated that HE WAS PREPARED TO INTRODUCE A BILL DURING THE COMING SESSION; and from his wishing the Deputation to furnish him with particulars

in writing of the objections to and short-comings in the Earl of Carlisle's Bill of 1852, it would appear that a modification of that Bill is soon to be placed before the country. At the same time, from the prominence given by the various members of the Deputation to the necessity for such provisions as those in Mr. Ker Seymour's Bill of 1854 (for minor outfalls), it is to be hoped that the Government Bill will include both the classes of wants which are pointed out in the above remarks of the speakers at Whitehall. When the Government proposals are before us, we shall be able to say whether they can meet these widely-different objects; or whether we ought not to have an inquiry by a "roving" commission into actual grievances and manifold means of redress, before equitable enactments adapted to all districts can be framed and passed.

RIVER REFORM.

BY A LINCOLNSHIRE FARMER.

It does not appear, from any notice I have seen, what are the precise objects to be brought before the meeting to be held at the Hanover Square Rooms, on the 12th Dec. One likes to know what is intended to be done, so that we might aid or oppose, as we deem best for the public good. It is no new thing to legislate upon matters of drainage and river outfalls. I read that in the reign of Henry III. statutes were made dealing with rivers, stanches, &c.; and in the reign of Henry VI. commissioners of drainage works were appointed, whose chief duty was to remove nuisances and obstructions, and look to the maintenance of works, and this for a limited time and for limited districts; but in the reign of Henry VIII. a statute was enacted, establishing "commissioners of sewers upon a general basis, and another of the 3rd Edward VI. perpetuating them for ever, for the conservation of low grounds in the whole realm." Much information on early drainage may be obtained from Dugdale on Drainage and Embankment, or rather "History of Imbanking and Drayning," a highly interesting work of its kind and of its time. The great powers now in being for effecting the drainage of the whole kingdom, were given under the Act 3rd and 4th Will. IV. cap. 22, to commissioners of sewers, and creating an almost omnipotent body, responsible to no power, and capable by their own decrees or orders to effect and complete any system of drainage they may think well to undertake, even to the extent of improving or altering river outfalls. The actual power of these courts of sewers is almost unlimited, provided the usual routine as to presentment, petitions, complaints, and the like, are properly gone into, according to the directions of the act. They can, if they please, appoint a committee of members to investigate and examine into the case of any petitioner or complainant, or presentment; and if the case is deemed fairly made out, they can direct the work to be done, and a rate to be made upon the lands proposed to be improved. The consent of three-fourths in value of the owners and occupiers of these lands is requisite, to enable them to levy the rate, otherwise the whole control is in the hands of the commissioners.

It would, then, appear that the powers of the commissioners of sewers is all that is wanted, to effect the object which the promoters of the present movement aim to achieve. It is chiefly in carrying out these great works of improvement where the difficulty lies. I presume no one would desire to establish an irresponsible body, with power to execute large and comprehensive

works, and lay enormous rates or a heavy taxation upon districts, without the consent of the parties to be rated or taxed. That would be "un-English indeed." The great fact is, that there are vast works, and vast improvements to be made in our arterial drainages and river outfalls, of which the general public are unacquainted; and the great question is, as to whether these important works shall be done before the public can be sufficiently informed and prevailed upon to consent to be taxed for them, or not. This was the case in Ireland, and great dissatisfaction resulted, till at last the commission was suspended or given up. There the commissioners acted upon their own judgment and responsibility, without the consent of owners and occupiers. In this country such a course would never be tolerated. The British public will have a voice in their own affairs, and perfectly right too. I am not sufficiently acquainted with these late Acts of Parliament as to say they are of general application. Various modifications may be required, and perhaps an amalgamation of best of the provisions in Lord Lincoln's Act and the Sewers Act might be advantageously effected. This is one important matter for the consideration of the meeting. Will a comprehensive improvement in the existing Acts of Parliament be sufficient for general application to every existing difficulty with respect to trunk or arterial drainage? or is a new act especially called for? My impression is that a consolidation of the existing acts will suffice. Of this one thing I am fully assured, that great good will arise from such a repeated ventilation of the subject as this meeting and the public papers will give. The public require the subject to be continually placed before them by diffusing good and authentic information of benefits derived and of injuries sustained, of floods and disasters, of losses and gains; examples of good drainage, and its beneficial results; examples of impeded rivers, and blocked-up drainage, and its woful damages, and the like. We know that the half has not yet been told of the injuries to individuals, and the immense losses to the community, from the disgraceful state of our river courses. To health and to wealth it is equally detrimental.

As a practical farmer, I fearlessly assert that were the public fully alive to the many advantages to be derived from a well-perfected system of arterial drainage, not a day would pass without a simultaneous and universal attempt to carry it out at once. It is quite a blot upon modern agricultural works. It is next to

impossible that our beautiful valleys and our richest alluvial lands can much longer remain under an imperfect system of drainage, or rather no drainage at all; nay, what is worse, the obstruction of such drainage as they have—their natural drainage—in so many ways; *i. e.*, by useless bends in the rivers, by mills, weirs, staunches, bridges, &c. Only permit a free course for all our streams and rivers down to the grand receptable—the sea—and a fig for all floodings and waste. Why, our lowest fens are better drained at the present time than almost any other part of the kingdom. I had a letter only this morning from a friend who farms in one of the lowest parts of the Cambridgeshire fens, stating that he should finish his wheat-seeding this day (5th of December), and he puts in about 260 acres annually. Can other parts of the country exceed this? The ditches, too, are so well drained, that the sheep on cole-seed are in no danger of drowning. Hurrah! for good drainage!

It does appear to me that very much has yet to be done. We have no reliable report of the actual state of our rivers and outfalls—no “Blue Book.” This is another important subject for discussion at the meeting. I am no great advocate for the establishment of Boards of Commissioners; but I think the Government ought to engage a few competent men to report upon these matters. We hear of floods here, and floods there, doing immense damage; but no one interests himself to prevent a recurrence of similar disasters in future. We want to know the state and condition of all our rivers and their feeders, the streams and brooks throughout the country, from actual inspection, if not actual survey. The latter would incur much additional expense. Therefore, upon ascertaining a case of gross obstruction or a bad state of the river, a point is at once made out for the establishment of a commission, or the application of the powers of a Commission of Sewers already in being, with a view to its removal. However, the information is the great thing required, and then

follows the action consequent thereupon. I must think that without this requisite knowledge we cannot clearly and satisfactorily proceed. I can imagine the task of getting up this knowledge to be no sinecure. We shall require to know the length and capacity and probable utterance of water; the number of feeders, and their courses and condition; the number of mills, bridges, weirs, staunches, and other obstructions; the various rights of corporations, navigations, landed proprietors, and the various winding courses it takes, and suggestions for straightening the fall from source to outfall, and suggestions for improving it. Such authorised reporters should be empowered to call upon parties competent, and compel them to give information—I mean public officers, surveyors, &c. I think in this way much valuable and reliable information could be obtained, and upon which the Legislature might fairly be called upon to pass an Act of Parliament for remedying existing evils. These inspectors might also offer acceptable advice and suggestions as to the division of the rivers into districts; for I imagine that ultimately such would necessarily be the case, for the working out of these improvements must be through a suitable organization, say a board of commissioners—the Enclosure Commissioners, for instance; for if they are not extinct they cannot have much to do. From them must emanate directions as to what it is desirable to undertake and do, and they should direct the surveys and engineering works. Under them should be a class of owners and occupiers, who might be the conservators of these districts, with power to levy rates and apportion them according to benefits received. In fact, there should be an organization something analogous to the Poor-law Board and its ramifications, which may readily be defined to each officer or class of officers, when the course of action opens out, and this, I take, it will depend much upon the valuable information gained in the way I have mentioned.

ON REMOVING FLOODS OF WATER FROM LOW-LYING LANDS.

SIR,—I have seen several articles in your journal deploring the mischief done by the flooding of meadow lands, owing to the crooked courses of rivers, and to the obstructions, natural and artificial, which prevent a quicker passage of the water. I beg to offer a few remarks upon the subject, if you think them worthy of insertion.

I am the occupier of twenty acres of meadow land, which is liable to flood, and which, in consequence, had become nearly covered with the coarse rough herbage so common in such localities. It is a rich loamy soil, and the river (a sluggish stream) flows round nearly three sides of it. In several places near the centre the land is from six to twelve inches lower than on the river's brink, and in these of course grow the coarsest herbage. Three years ago I drained it with two-inch round pipes, putting the outlets just above the surface of the water in the river when at its lowest point, and obtained a very slight fall for the drains by making them flatter in the centre (where the ground is low) than at the outlets. Since then it has often been flooded, and this year was covered with water three times between May-day and Midsommer-day; notwithstanding, so soon as the water was off, the drains ran freely, the ground in a day or two was solid enough to bear oxen, the coarse herbage has nearly disappeared, so that it has this year carried more “stock” than I ever knew it do before. I now consider every flood does it good, whereas before

the drainage it did harm. I am therefore inclined to think that if others adopt my plan, instead of *complaining* of the obstructions to the water, they will be wishing they were more numerous, that their meadows might be oftener flooded.

You also speak of the land which is damaged by being flooded from the heading-up of water for the use of mills. To this I would say that the remedy is precisely the same as in the other case. All water-mills have the water at a low level at the tail of the wheel; let a main drain be carried to this point, and the land which is flooded by the mill-head drained into this main drain, the same as I have drained mine into the river, and then the oftener it is flooded the more grass it will grow. The miller's object in keeping his head of water very high is that he may obtain a greater fall, and so increase his motive power. If the land is drained as I propose, he will lose more by the water which will escape through the drains than he will gain by the increased height of his mill-head, so that if he has been in the practice of doing so, he will then desist for his own sake, and only flow the land occasionally, which will be much to its benefit.

With regard to making hay in such meadows, I can only say I think it should not be attempted. With such a demand for meat as there is in this country, surely we can make it as profitable to graze the margins of our streams as to mow them.

I am, sir, your constant reader,

S. H. S.

CHRISTMAS TIME.

Christmas comes upon us once more with a hard, hearty, old-fashioned grasp. It is really "seasonable weather." The ice bears, the snow-flakes fall as we write, and the very railway-trains—like the stage-coaches of another age—are hours if not days "behind time." To the affluent, the hale, and the young there are many charms in such a change of scene; and that long-looked-for twentieth, "when our vacation will commence," is ushered in with skates, snow-balls, duck-guns, and other as characteristic insignia of a hard winter. But, fortunately, it is the especial peculiarity of an English Christmas that the more severe the season, the more only does the genial influence of that great and holy day seem to tell upon our feelings. Under an Italian sky, and in a warmer clime, it could not be half as "jolly" or generous, a feast, as we make it, with our nipping breezes and hanging icicles without, and our blazing fires and smoking boards within. There is good in everything; and even a hard winter is not without a moral—perhaps the most practical of all. As we feel it ourselves, so do we learn to feel for others; and "my Lady" distributes her blankets, while her Lord cuts up his bullock; and a pang goes to the heart, when we remember any that are uncared for, at such a merry-making.

As a rule, we are all apt to associate Christmas "proper" with a rural life. It is true that as we hurry along the slippery pavement we stay for a minute to note the glories of the butcher's window, where there are more sheep "hung all in a row" than we can stay to count—backed by magnificent sides of beef bedecked with rosettes and ribbons, and coquettishly half-showing and half-hiding in the layers of fat the Smithfield Club Card, which tells that this was MR. HEATH'S DEVON STEER, or the DUKE OF BEAUFORT'S PRIZE SCOT. Almost every other shop is as suggestive of the occasion. The pastry-cooks tempt you with plum puddings positively black in the face from the way in which they have been stuffing themselves; the grocer is as prodigal of his dried fruits and candies and spices; while Covent Garden tells you at every stall, how the whole world has been ransacked of its riches to do fitting honour to the Englishman's high-day. Like Mark Tapley, the citizen makes himself as happy as he can "under such circumstances"; but it is still to the country we turn when we would keep Christmas as we should do. Here people are knit together by closer ties, and there is not a man in the parish church, on this most solemn of services, but that the vicar should know by name, and the squire give a greeting to, as they join each other in the porch. It is this close association between the rich and poor that rightly hallows such a day; and it is upon this that we would still depend for the due celebration of the festival. At such a time a man's duties must be essentially active and practical; and we all have them one to each other. Let the landlord reflect, as he rides with his boys round his estate, or follows with them the winding stream in search of a snipe or a moor-hen—let him ask of himself how such a season tries his tenants and dependants? Let him now remember, the rather, how long the seasons have been against them, and what he may do for them in their trouble. It would be altogether idle to attempt to say but that the tenant-farmers of the kingdom have had immense difficulties to contend against, and that these are even by this time anything but overcome. The position,

in fact, is still a critical one. There are many claims to be met—chiefly by a product just at present in an almost unsaleable condition. We need not say which is amongst the heaviest of these demands, nor is it likely that the sufferer will himself offer to do so. Like the gladiator of old, he has a heroism which would prompt him rather to die in silence than to cry out for mercy. Any such act of grace then, to carry the good it should do with it, must be spontaneous and self-suggested. Already, however, it is not without precedent, and we have only to hope that the names of Lord Tredegar, Lord Lonsdale, and Mr. Benyon will but lead us on to find many as worthy and as considerate amongst the landlords of England. They must know as well as we do how much their consideration is required.

But Christmas time points still more directly to the care of the labouring man; and, curiously enough, he is just now everyone's care. The Premier of England, simply as "the good man" of his own home, takes him by the hand, and encourages him to better things. There are few more thoroughly national pictures than that of Lord Palmerston at Romsey, distributing amongst the rural population prizes for good conduct, skilled workmanship, sobriety, economy, and the development of other such domestic virtues as the idle and the ignorant have so impotently essayed to turn into ridicule. What a commentary does the Prime Minister of England offer on all this abuse, as he stands in the Town-hall of Romsey, the ministering hand of this much-maligned system! His Lordship, however, does not stand alone; and the workman—his home—his morals—and his welfare—are topics we are all talking upon. Country magistrates are writing letters and Poor Law guardians are answering them, while *The Times* looks on with the thunder-bolt ready poised to deal out destruction on the offender. But it is not needed, at least not in the quarter more frequently referred to. Never was the case of the agricultural labourer more his master's thought than it is at present. On that very day when cottage accommodation was made the world's talk, the farmers were talking of it quite as earnestly amongst themselves. Over-stated as we believe the subject to have been in *The Times* correspondence, it will be seen that those most directly interested were as little inclined to pass it over. A comfortable decent home is one of the first points insisted upon by Mr. Scott Burn in the able paper he read at the last meeting of the Farmers' Club, and which we shall give in full next month. The labourers' morals and comforts were equally the aim of those who followed him. The Club has often had the credit of discussing matters at the right moment; but nothing, as it has happened, could have come more opportunely than "The condition of the Labourer." It is everywhere alike in good time and place. We may compare the essay with what Lord Palmerston has since said in Hampshire; we may "prove" it by the many charges and statements published almost simultaneously; and we may dwell over "the points" as peculiarly applicable at Christmas time. It is then that "HOME" becomes, indeed, a sacred word, and when it is our first duty to see how such a word is being interpreted amongst us. Without the decent comforts of a home, "A happy Christmas!" sounds but as a mockery.

ON WINTER PLOUGHING.

Much has been said, and still more written, in the few past years, about deep cultivation; and ever since the advent of steam-culture, it has been a favourite topic amongst modern agriculturists. It is undoubtedly a great advantage as applied to all deep soils, and more particularly to clayey loams; but it will unquestionably benefit any soil ultimately, although some sands and gravels may not at first evidence it. Deep cultivation when applied to adhesive clays requires care and judgment. It is not desirable to drag up too much stiff or hard clay from the subsoil at one operation, as it will take more than one season to ameliorate it and bring it into fruitful action, and the consequent partial loss of crop for a year or two. The best practice with heavy clays is to bring up the subsoil gradually, year by year, and thus mingle it with surface soil till a deeply pulverized soil has been attained. It is then that it becomes one of the most valuable of all soils, and capable of bearing a long succession of heavy cropping; the retention of the manures applied, and the disintegration of its innate ammonia, adding greatly to its fertility. In almost every other variety of soil, the subsoil when brought to the surface comes more directly into fertile action, and amply repays the outlay. It is almost indispensable in the production of a heavy root crop. Long mangolds revel luxuriantly in a deep well-pulverized soil. Potatoes seem quite at home in a deeply worked loam or clayey loam. Turnips prosper exceedingly in lighter soils, also deeply worked; and these are all the better by being subsequently rolled, or consolidated in some way. There should never be a vacuum between the root of the plant and the subsoil, hence compression is necessary to bring a crop to full perfection. In a dry season it is imperative. In wet seasons the soil becomes naturally compressed by the rains falling, and atmospheric action upon it. In fact, and speaking generally, the soil requires that preparation which will permit the roots and fibres of plants to find food in the greatest abundance amongst the pores and the clefts and crevices made by good and suitable pulverization in the soils cultivated.

The first and most effective way of obtaining this suitable culture is by deep winter ploughing. I am glad to find this practice is much on the increase. The implement-makers of the present day have done good service in producing ploughs for deep work at a moderate cost, and fully up to the requirements of the various soils. The heavy-land ploughs are strong and compact, and do the work admirably, at a moderate price per acre. The light-land ploughs do very well upon light soils, with a larger "mould-board" on than for common ploughing. Any useful plough can be made to plough any reasonable depth, but it is generally attended with much extra draught. It is best to have suitable ploughs for the service. My occupation is rather a strong loam; I am using two of Ransome's and one of Howard's common-purpose ploughs daily, with the higher mould-boards on; with these, drawn by three horses each, "unicorn fashion," *i.e.*, two abreast, and the leading horse down the furrow, we are ploughing furrows from eleven to twelve inches wide and nine to ten inches deep. It is true the furrows lie or almost stand too perpendicularly for a judge's eye, but they appear just right to catch every advantage from atmospheric influences and the amelioration of frosts, and from which the rains pass down to the subsoil drains without poaching or injury. I have adopted this practice for many years, and one of the advantages derived

is, that a Biddell, Bentall, or steam-cultivator will pass readily through the furrows transversely when required, or in the spring, and thus save the great labour and cost of cross-ploughing, and at the same time pulverizing the soil equal to the cross-ploughing and scarifying combined. Of course, we take care to work our scarifiers when the soil is dry and in right condition for cross-ploughing. My mangolds of this year (twenty-five acres) were produced after a crossing of this kind, and proved an excellent crop. For potatoes it is an excellent preparation, and if it can be conveniently crossed in fine weather in the months of January or February, often does much to forward the planting.

But there are other crops for which, if it is not altogether requisite, it is very convenient that the ploughing be proceeded with in the winter. Hence much land is "ploughed fleet" for barley, upon thin barley soils. On strong clays, too, much land is winter-ploughed for beans and peas. Both ways constitute good farm practice, according to the soils. The chief thing is, to take care that in no case should the land be ploughed when it is not in a proper state. To plough heavy-clay land when saturated with wet is a partial kneading, as for brick-earth; and to plough light, sandy land after a dry frost, is turning it up for a February or March hurricane. The farmer's judgment must be his guide as to the proper time and condition of the soil for ploughing. Clay lands are much benefited by being turned up for a frost; and it saves much working at seedtime. Turnip lands should be ploughed immediately the turnips are fed off. It adds much to their fertility, in securing the sheep-droppings as manure. Grass lands to be converted into arable may advantageously be ploughed in the winter. The grassy sod becomes rotted, and forms an admirable manure for the potato or mustard crop, to which such converted lands ought in almost all cases to be appropriated. It is seldom that a cereal crop is prosperous on "new land"—plenty of straw, but little grain.

I know not how to offer a word of advice, in this most difficult of all seasons, for winter ploughing. I can only reiterate what I have often said—*i.e.*, to see that everything is done in a business-like way, or to let it alone, and wait a more suitable time. It is perplexing when it is found requisite to do all the work of the farm in a short space of time; but it is better to wait than to do business foolishly. We must also bear in mind that science is rapidly advancing to our aid; and what would take our teams weeks to accomplish, the power of steam can effect in a few days. In this way, we are becoming almost independent of seasons. I am fully convinced that, on the majority of strong lands, it is wrong to plough at present. By all means, wait awhile. We may have a fine dry February. At all events, it is in good time yet; and if, indeed, worse goes on to worse, and we have to wait till spring, we must then have double diligence, as well as use and hire all the teams we can procure, and, where practicable, call in the aid of steam. Every farmer knows that, if he ploughs his land in a wet state, it takes much extra working either to prepare it for a seed-bed or in fallowing; so that no time is, in reality, lost by waiting; and it is very certain that in almost all cases a much better crop is likely to be realized, from the inherent virtues of the soil being disintegrated by a summer's sun rather than a winter's frost, and the variable weather of the past two months.

ON THE IMPROVEMENT OF INFERIOR GRASS LANDS.

A large portion of the country is lying in permanent pasture and meadow. An excursion through the provinces cannot fail of impressing the mind of the tourist with a conviction of this, also that the management of such lands enters largely into the practical agriculture of Britain.

Much of this land is not in a very profitable state of husbandry; its annual return yielding little to the landowner, and less to the tenant. Indeed, if the latter had the whole to himself, it would be but a poor concern, in very many cases.

Geologically a large extent of this inferior pasture and meadow land cannot be pronounced unproductive naturally. On the contrary, much of it, if under a different system of management, would yield abundant crops of every kind, and fair profits on capital. In other words, it is capable of being improved, so as to become profitable to both landlord and tenant.

The cause of this unprofitable state of such lands becomes thus an interesting subject of inquiry, with a view to its removal. Originally there may have been little to indicate the difference that now exists between them and other lands, yielding fine crops of hay, and a full bite of rich grass to cattle. It may be, the former was the most promising of the two soils; but now the tables are turned, the reverse being experienced. By what train of facts then do we arrive at this conclusion? What is it that has kept up the fertility of the one to a profitable level, and lowered that of the other below it?

These are questions which must ever remain surrounded with much obscurity. At the same time the grasses in every case indicate their present state of health sufficiently plain to tell us that pathological and hygienic differences exist between them and those growing in our richest meadows and pastures, and that we have to bring these to a common standard before we can attain to equality as to profitable husbandry.

The successful growth of the grasses is as much a matter of health individually and collectively as the growth of cattle. We know very well that when the ox does not thrive he does not pay his keep: the same is true of the sheep, the horse, and all our live stock. And what is thus true of individuals, is also true of whole herds and flocks: upon their sanitary condition depends the farmer's profit. By a similar train of ratiocination we arrive at a similar conclusion relative to the grasses. Every single grass-plant is, like the ox, a living being, or organism, paying for its keep just in proportion as it thrives. And as it is with every grass-plant individually, so it is with all the grass plants in the field: as they thrive they pay the farmer.

Apart from consecutive considerations, these are very simple premises, leading to equally self-evident conclusions; but when we enter a field of pasture where cattle are grazing, and begin to investigate their application, we meet with circumstances neither so very simple nor yet self-evident, especially in reference to the grasses.

Confining our observations to that class of pasture and meadow-land yielding an inferior quality of grasses, we have consequently, along with bad pasture, cattle also not in a thriving or profitable condition. On examining the latter, we at once, and very justly, conclude that their

poverty arises from the inferior quality of the pasture. The best of it is "bad feeding ground," while the greatest extent will only carry the worst kind of store beast, or a few sheep. Before we can produce butcher-meat, or dairy produce for market, large quantities of corn and cake must be consumed, and then the result is more frequently loss than profit to the grazier.

On commencing the examination of the grass-plants individually, in order to ascertain the reason why those of a good quality are not thriving, and those of a bad are prospering luxuriantly, there may be in many instances no little difficulty experienced in arriving at a satisfactory conclusion, owing to that part of the plant upon which its health principally depends being below ground, and hence unseen. Under such circumstances we must either draw haphazard conclusions, or else proceed to break up the ground, in order to look below the surface for the facts of the case.

Although experience may enable us to form a pretty accurate conclusion as to the sanitary condition of grasses from appearances above-ground, yet the more advisable course is to examine the whole plant, more especially that part of it—i.e., the roots—upon which its health chiefly depends, as this will enable us the better to avoid erroneous judgment relative to the best means of improving the pasture. To supply manure or top-dressing of any kind before we are certain as to the pathology of the best grasses—those whose health we wish to improve—is, to say the least of it, short-sighted policy, often leading to very heavy losses. We have tried experiments with guano and other artificial manures, as well as with farm-yard manure to such lands, but never with a satisfactory result. The cases are few, and exceptional in character, where manure can be advantageously applied to pasture or meadow lands where the roots of the finest grasses are not in a healthy state, but where weeds and sour herbage luxuriate.

The dissection of the ground, with a view to ascertain the sanitary condition of the roots of grasses, is a very nice operation, one requiring no little skill, patience, and perseverance to perform it successfully. This arises no less from the great depth to which the roots of grasses often go, than from the manner they are matted and interwoven amongst each other, the roots of the fine grasses being entwined with those of the bad, while there is always a large portion of both in an effete and decaying condition: But, however numerous and great may be the difficulties experienced, the work should be prosecuted with the greatest care, until satisfactory results are obtained under the microscope.

Among the more common causes of unhealthy grasses may be enumerated imperfect aëration of the soil. A proper supply of pure air is essentially necessary to healthy vegetation, no less below the surface of the soil than above it. The roots require air as well as the leaves; and unless they receive the necessary supply, they become sickly, ultimately dying and giving place to those for which the soil may be better fitted.

A very large and diversified class of grass-lands is imperfectly aërated. They are generally denominated clay soils, but in many cases there is not much clay in them. They are also generally subject to the extremes of drought

and moisture, being burnt up in dry scorching weather during summer, and drowned in winter and wet springs. In many cases, however, they have a sufficiency of bottom water to keep the subsoil wet all the year round, the deep roots of the grasses in such cases being continually in an excess of water and deficiency of air.

A large area of this kind of pasture and grass land has been drained, and much good done thereby towards its improvement. There is no denying this, as the facts of the case are manifest to all who have any experience in the matter; for the land is not only drier, but producing a finer quality of grasses for cattle.

The mere drainage of such land is, however, but a slow process of aëration at the best, while in very many cases it is wholly inadequate to meet the exigencies of the case. We know, for example, grass land drained upwards of twenty years ago, three, four, and five feet deep, where rushes are still growing over the tops of the drains, and where the sour bent-grasses generally predominate, forming a thick matted sward of coarse grass, which cattle, sheep, and deer will not eat, until it gets the winter frost, when it slowly disappears. In other places rushes cease to grow over the drains, but luxuriate between them. In a third example, rushes cease to grow altogether, but the coarse grasses continue in possession of the land. We might thus go on quoting innumerable examples where a period of twenty years has produced very little effect towards the proper aëration of such lands.

We might also commence at the opposite extreme from the above, where drainage produces the greatest effects upon such grass lands, when it will be found that the process of aëration is also slow, and that, whenever the soil approaches to a certain degree of stiffness or tenacity, the work even at the expiry of twenty years is very imperfectly performed.

The reason why the process of aëration is thus so slow and imperfect by draining, is manifestly this—drainage is not aëration. This rationale may be somewhat brief, and perhaps pertinent, but it comprises the simple facts of the case, and we fear it is by inattention to this simple train of facts that so much diversity of opinion is expressed relative to advantages gained by draining grass lands, and that so much disappointment is experienced by some, when they do not realize results equal to those of their neighbours.

What, then, are the effects produced upon such lands by drainage? What does aëration effect? And what is the upshot in the absence of both drainage and aëration?

In the former of the above extremes there was a bottom supply of water, that kept the rushes growing. We have seen a spring burst up only about a yard from the drain—the water to flow over upon the surface to the drain, and then disappear. In another case the strong gault clay prevented the water from rising, as above, in a flowing stream; but the roots of the rushes went down to a depth sufficient to obtain the requisite supply of water. In another case, where there was no bottom water rising and no rushes, the land was sour; and in wet seasons, like the past, it was soaking wet all the year round, while in dry scorching seasons it was rent into fissures deeper than the drains, the soil being baked or consolidated into bricks, instead of being aërated. Our space will not permit us following up the details of so comprehensive a question as those involved in the one before us; but the reader will readily perceive that the effect produced by drainage in this case is not aëration, but the reverse—the exclusion of

both air and moisture, comparatively speaking: two elements essentially necessary to the fertilization of the soil and the consequent growth of fine grasses.

In the other extreme, where drainage produces the greatest effect, the land is naturally more porous—full of vegetable matter, so that it is less liable to consolidation and scorching in summer; while in autumn, winter, and spring it is in a more healthy state, suffering less from evaporation, and the removal of heat thereby from the surface. It is also less subject to the rising of sour water from the bottom; so that the work of improvement gradually progresses as the roots of the grasses fill up the new fissures annually made by the summer sun.

The proper aëration of grass land is a compound question, involving not only the free circulation of air, but also night dews, and the like; besides the retention of moisture, and even the manufacture of water and ammonia within the soil. It is, in other words, the conversion of the soil into a laboratory, so as to enable Nature to produce a certain train of chemical processes necessary to the growth of the finest grasses; and, consequently, essentially necessary to the profitable husbandry of such lands. To expect such conditions from the mere drainage of the vast majority of such lands would be the height of credulous absurdity, for they must be thoroughly loosened and disintegrated before the desired effect is, or can be produced.

It also ought to be borne in mind, in the investigation of both these classes of examples, that drains do not remove water from grass-lands during the principal period of the grass-growing season, unless in exceptionally wet weather. From them, at such seasons, water is removed by evaporation, and along with it heat; and both these results we wish to avoid. We wish to retain, for example, both the water and the heat; and this is the result obtained by the proper loosening and disintegration or mechanical subdivision of the land. The removal of those coarse grasses that send down their roots to a great depth, in search of water and acidulous food, and that bring up the same to the staple soil by capillary action through the instrumentality of decaying roots, is also necessary.

Where such grass lands are neither drained nor aërated the tale may be soon told, as, during that season of the year when water is not required, they are both cold and wet in the extreme. When they begin to require moisture for vegetation, evaporation carries off the heat; so that vegetation is next to nil, so far as good grasses go. And when this evaporation ceases, then there is no moisture in the soil, but a scorching excess of heat; so that, instead of vegetation, we have a burning brick kiln!

A large area of this inferior grass land contains an excess of effete vegetable matter. In some cases this arises from imperfect drainage and aëration, as already noticed; in others, from a want of mineral element, as lime, &c., &c.; while in not a few cases it arises from the joint action of both these causes—a deficiency of air and certain mineral elements to produce a healthy decomposition of waste vegetable matter, and supply of food for the fine grasses. In examples of this kind, the remedy is too manifest to require notice, after the malady has been ascertained. Nothing can be more injudicious or wastefully prodigal than to pare and burn such grass lands in order to get rid of the excess of effete vegetable matter when healthy decomposition takes place, as when such lands are trenched up to a proper depth, there is not then too much vegetable matter in them, but the contrary in the vast majority of cases.

Again, much of this inferior pasture is produced by an unsound subsoil—one containing ferruginous or other substances injurious to the health of the finer grasses. The roots of some plants will luxuriate in such soils, but not those relished by cattle. We have met with numerous examples of this kind, some of them very interesting.

They differ widely from each other, both as to the nature of the noxious substances in the soil, the kind of herbage grown, and the effect produced upon cattle. In every case the cause must be removed before a profitable state of husbandry can be pursued.

A. B. C.

RIVER REFORM.

SIR,—I hope no one will imagine that the Arterial Drainage Meeting, to be held in Hanover-square Rooms during the Smithfield Club week, is to be a mere concourse of abolitionists, determined to upset the process of grinding flour, driving spindles, working looms, or moving any mill-works whatever by water pouring upon the floats of a water-wheel. I hope no one will suppose that we, the drainers, are seeking to dry up all canals, and send barges by the railway; to drain all fish-ponds, and let off ornamental waters; to prevent any brook from being conducted over meadows, and to confine the use of every river, stream, and water-course to the one sole purpose of carrying off spent liquid from six-foot-deep drainage-pipes. We say that in the annual downfal upon Great Britain are received the greatest riches and blessings; fertilizing stores for the greedy yet prolific soil; buoyant pathways for the sluggish boat and heavy-laden barge; cheap, unceasing motive-power for the industrious miller and manufacturer; moisture for the invaluable meadow herbage and hay; an element for the finny treasures of the sportsman to play in; sheets of limpid flood, to embellish the park of the noble, or the people's pleasure-ground; and supplies of "beautiful water," cleansing, purifying, sustaining alike the population of city, village, and open country. We say that, owing to the physical conformation of hill and vale, the geological structure of rocks and beds, the water-sheds and natural channels and springs distribute these downfal waters in such a manner, and in such directions, as to cause immense loss by injurious floodings in some localities, and all sorts of waste of power and usefulness of water in others. Nature provides the valuable agent: it is for Art to appropriate and apply it to the use of man. Art has been doing this for centuries, and has made good profit by mill-wheels, irrigations, navigations, fisheries, and so on; but then it has been art applied irregularly, disconnectedly, and selfishly, with no common purpose or aim, without reference to the general well-being of the inhabitants of these realms. Consequently the nation has not secured from the waters those full advantages which are derivable by treating the streams and outfalls on a comprehensive scale, in which every source of benefit should receive its due development, and the claims of all interests be equally considered. We say that the progress of husbandry, the pressure of an increasing population upon a limited area of cultivable land, the necessities of overgrown unhealthy towns and clustering villages seated in dangerous sanitary conditions, upon the banks of streams, the growing inadequacy of the channels to discharge floods

that are at the same time continually requiring a more rapid exit as the work of under-draining extends—that these and other considerations render it imperative, for the safety and prosperity of all classes of the community, that a general and governmental conservancy and supervision of the whole hydrography of Great Britain should be at once organized and inaugurated. The fens, marshes, and lowlands have been driven, in self-defence, to plan and execute new arterial drainage works, though sewers' commissions, and other means of preserving or amending old drains were existing there from time immemorial; and we say it is now the turn of the uplands to deliver themselves from deluge and the still more hurtful damage of a too high water-level without actual drowning. In some cases estuaries may need improvement; but, generally speaking, the exigencies of alluvial deltas have preserved and enlarged the mouths of our principal rivers, and works of only a simple character are demanded along the winding valleys and among the hills of our inland counties. The upland valleys have a natural fall: they require no windmills or steam scoop-wheels to bale out their drain-water; and if the proportion of ground damaged be in some cases but a narrow strip alongside the stream, the excavation or embanking needful for relief is commonly only such as the district is well able to pay for. In some cases, an old water-mill may be bought and demolished, or a decayed navigation be reasonably compounded with; or a string of water-mills be supplied with steam-engines and compensation for having to use coal instead of water; or a bridge may be re-built with a wider span and a deeper water-way; or a bending river straightened by a cut; or an embankment may make at once a barrier against inundation, and hold up a reservoir for increased mill-power or judicious irrigation. The cases and variations in cases will be of endless diversity, but still one principle may embrace them all; and we say that for cheapness and certainty, for facility and satisfaction, there is no means of bringing about the improvement of the vast number of tracts needing arterial drainage, but the passing of a general Act of Parliament for the purpose.

Now, I do not forget that we are a Saxon nation (with a pretty large mixture of other blood); that we must manage our own local affairs without interference of other folks; that we dislike any approach to Gallic centralization and the handing over of personal and district rights and privileges to a class of Government-paid officials and hungry job-hunting professional men. Therefore I hope no one will ever be found to advocate

the establishment of a board of national drainers, whose duty shall be to go round the kingdom and put right whatever water-courses they may find amiss, and make the district or the general public pay "the piper." There certainly are some things which the Government Executive can do for us better than we could do it by private agency or by companies. For instance, I never heard anybody say that a private firm or a public company, with the usual description of directors and shareholders, would make a much better job of the national letter-carrying and money-order transference than is now done by Government. And some people think that Government would have constructed railways and carried goods and passengers at wonderfully less total cost than our diverse and conflicting railway companies have managed to draw out of the popular pocket. But however this may be, it is equally certain that in many labours of national concern Government agency utterly fails in comparison with the management and achievements of private manufacturers, commercial houses, or public or joint-stock companies. We English do not believe in Government tailoring, Government manufacturing, Government newspaper publishing, Government hospitals, Government road-making, Government town-draining, unless in exceptional cases, or for special purposes. The general Act I wish for would be intended, therefore, neither to dictate and oblige districts to put their waters in order, and force them, against their own inclination, to make the best of their water-power and the most of their low-lying lands, nor yet to over-ride local rights, and proceed to execute works which Government engineers may fancy to be necessary, and saddle a grumbling country with a tax for the outlay. I want a law establishing a central authority, after the fashion of the Inclosure Commissioners, with rules of action laid down, jurisdiction defined, and so on, with a staff of engineers, inspectors, &c.; so that any district desirous (with a sufficient majority of the interests concerned) to improve itself, could do so by appealing to this constituted authority, without the intolerable expense of repeated Parliamentary contests, and without the victimising squabbles of rival schemers and swindling speculators. For in local drainages, as well as railway projects, such characters frequently take care to play off one interest against another, and line the pockets of city "stags," of engineers, solicitors, and contractors with the clippings of whole parishes and confiding shareholders whom they have diddled and fleeced. Before I conclude, I will try to convey an idea of the difference in expense involved by the two methods of draining, under a general and under a local Act; but just now look at one or two objections. Engineers and others likely to be placed on the Government staff, for their scientific attainments and eminence in their profession, are most likely to be inspired with ideas in advance of their age: they would want a mean hydraulic depth in the rivers greater than the country to be drained has any appreciation of: they would recommend extreme measures, calculated to make the very completest and most perfect systematic drainage-works ever seen, regardless of the required outlay, or expecting that sufficient improve-

ments must immediately follow in the agriculture of the district, and raise the value of the land more than enough to warrant the expenditure. This was the experience over and over again in Ireland: a grand improvement was made, and an increase of crops, &c., soon demonstrated the value and ample profit of the works; but still it was found that people, benefited against their will, or put in possession of facilities for money-making beyond their understanding and appreciation, repudiated the boon, and quarrelled with the men of genius, who would not let them muddle on in the old way when vast advances were practicable. But I cannot see why the dread of getting too good a drainage need militate against a general Act. We have the lessons of all the Irish arterial drainage blue-books before us, as well as the experience of innumerable reclamations and river-works in England itself; and surely provisions might be framed by which English local "interests" (so different, be it remembered, in their habits of self-reliance, independence, and respect of vested rights to corresponding interests in the sister island) might be enabled to work out their own notions, and go no further than necessary for the satisfaction of all parties. We do not hear loud complaints of the proceedings of the enclosure authorities, or complaints from parishes about allotments of common, because no separate local Act has compelled and arranged the apportionment; and why cannot larger operations be conducted on similar principles?

Again, I am aware that there are notable examples of river improvement already attempted or carried out, calculated to caution us against meddling with large streams, trusting to the representations of engineers, or placing faith in the equity of compensations awarded to proprietors in such undertakings. Districts have at great expense obtained a most beautiful drainage, according to published reports; whereas in reality the floods are still inflicting injury, and while a heavy drainage-tax is levied on unfortunate owners and tenants, the proprietor of some water-mill has been lavishly paid by the scheme which he promoted. The Nene Valley project, while effecting certain improvements in the harbour of Wisbech, and in the state of the lands lying along the river, has ended in saddling the district and various interests with enormous expenses, without a commensurate equivalent in better drainage or navigation, leaving the remodelling of that river to be completed by some future unlucky generation. But properly such cases tell against the present system of local Acts of Parliament, instead of reasonably deterring us from works of river reform under a general Act. It is just because districts are left to fight their own battles against adventurers and schemers, to struggle with non-consenting or opposing interests, to agitate, survey, choose plans, pay lawyer after lawyer, and carry on an enormously burdensome parliamentary contest, before a sod can be turned or a sixpence raised from the lands proposed to be benefited—it is because this unaided, roundabout, costly procedure is imposed upon whoever dares to move in the cause of improved outfalls, that such scandalous cases have arisen, and that such

egregious blunders have been perpetrated in the name of arterial drainage. I am no advocate for having even the best project forced upon a locality that is willing to improve. As long as liberty reigns within our sea-girt isle, every man or every voluntarily-associated community of men have a right to select the goods which they will buy with their own money. Every district ought to choose its own drainage scheme, possess the command of its own purse, to invest in any scheme, or none, if such be its pleasure. Only, out of regard to public interest and the national well-being, there should be some authority constituted, in a position to prevent one district from injuring another district by a foolish undertaking, or by refusing to apply any remedy at all. A General Drainage Commission should sanction all projects before they can be executed. And, of course, in each district a majority of interests (defined by the Act) should outweigh and bind the minority in that district. What could be easier than to subdivide Great Britain, or the more watery portions of it, into drainage districts? Take your pencil, and trace a line round the heads or sources of streams and tributary brooks marked on the Ordnance map, so as to include within a single boundary any one main river with all its feeders—that will be a drainage district from the surrounding watershed to the river embouchure. All the waters in England might be similarly grouped together, forming districts, each with its own outlet to the sea; and where the lower portions of a river may be already under management and controlled by artificial works, the upper portions must, of course, be improved in relation to the state of the channel below, and special provisions be made in the general Act, empowering that upper district to negotiate or amalgamate with the interests below. The process by which any drainage district might commence the work of improvement would be very simple—perhaps something like this: Any one or more persons interested would memorialize the Drainage Commission, engaging to defray the cost of preliminary proceedings if the work did not go on. The Commissioners would then make an inquiry, survey, and report, which would be submitted fully and sufficiently to the landowners and all other parties concerned. If the majority of interests agreed to the advisability of arterial works, a committee of works and trustees would be elected, to select from plans suggested by the Drainage Commissioners, or by land drainage companies, or the proposals of private engineers invited to assist. This board or committee would conduct the whole business of the undertaking, and raise funds by assessing every interest in proportion to the benefit likely to be derived. The district would thus be able to devise, support, or decline any scheme, as at present; but it would possess the vast advantage of an organization ready-formed, and wanting only the appeal of a reliable proprietor in order to submit proposals at once to the approval or rejection of all parties whatever who might be concerned, and possessing the requisite Parliamentary power for authorizing the works agreed upon. In the great Irish drainages, works were carried out in 122 districts, extending into nearly every county in

Ireland, on the lands of 3,100 proprietors, and surveys and engineering reports were made of 452 districts more. According to our English system of local Acts of Parliament, the law-costs alone would have been enormous, to say nothing of the inevitable suits, juries, arbitrations, &c., during the progress of the works—£800 or £1,000 being a very small sum to expend in merely carrying a bill through Parliament. But as general Acts formed the Parliamentary authority under which the works were executed, it is a fact that the law-costs, including the suits, juries, &c., scarcely exceeded £1,000 for the whole of the 122 drainages. Our own Inclosure Commission gives us a similar example. The general Acts under which it operates cost the district nothing at all; and the expense of preliminary proceedings is under £20 for each district. Government underdrainage, again, costs £5 per acre; yet the administration of the Drainage Commission amounts to only two shillings per acre. Now turn to the system of local and private Acts. What is the gross amount of money wasted in carrying Acts for all the fen-drainage and estuary works cannot be ascertained; but the sum would no doubt appear fabulous, and large indeed, in comparison with the cash actually expended in constructing the improvements. The first Act for making the Eau Brink Cut, on the Ouse, above Lynn, cost £12,000 to the promoters alone, while the bill only proposed to lay out £40,000 in the work. The Nene Valley Drainage was to cost £275,000; yet, as Mr. Bailey Denton said in this paper last month, the Acts of Parliament have cost over £30,000—or not far short of £2 per acre—for law-costs alone. And he tells us, again, that the Norfolk Estuary Acts cost more than £40,000; while Messrs. Peto and Betts' contract for the works was but £142,000.

Yet the question of a general Act has been before us for years; and reformers have been agitating and urging an immovable public—which soon sinks again into stolid quiescence—until they are sick with labouring for a cause that every man slights. It is ever so: John Bull will always begin a reasonable system in public affairs about a century after it has been proved to be advisable; he will always let recklessness and stupidity filch and squander his abundance—because he is too stout and good-humoured to interfere.

Nobody wants to compel the drying of meadows which now yield good hay. If it is a fact that they are more valuable in their present aquatic condition than if well drained and ploughed, the district in which they lie must surely know this, and can reject any scheme for the purpose. Nobody wants to deprive a mill of power, or cut off the supply of water to a factory, or subvert a navigation, if no balance of advantages would be gained by such a course. The drainage district must alone be its own judge of its necessities. Only we, the drainers, are determined that their case shall be introduced to their own notice, and remedial measures be submitted to their judgment—this we shall accomplish by a general Act. And it is very clear that general rules for regulating compensations, compositions, purchases, &c., could be easily framed; because our rivers

are capable of being classified according as they subserve the purposes of mills, navigation, simple drainage, or any one or more of these and other objects; and the remedial measures will be of similar character in certain descriptions of cases. We have already a sufficient number of precedents of the purchase of mills and canals, and compensations of all kinds, to guide us in framing a new general Act, or to direct the elective Boards or Committees in the drainage districts how to proceed in dealing with rights and claims.

I have not time now to comment upon the question of an improver's right of water-way through the grounds of neighbouring proprietors, who, seeing no special value in a deep-level drainage, may refuse to do more than maintain an old water-course of the same width, depth, and section which it had in the time of King Alfred, or perhaps of the ancient Britons. All cases touching upon such rights of discharge from lands farmed on modern principles would be duly provided for in a good general Act.

Our rivers and streams are now under some sort of conservancy; but with the kingdom divided into drainage districts, I conceive that proper officers might be appointed to watch over and examine every portion of the tract forming a district, from the tidal harbour to the ditch which has to convey the water of more than one farm. If you want a model for such a state of things, go to the Bedford Level Corporation, who manage an immense network of drains, banks, and sluices in the Fens.

You will find among their officers the engineer, who has his annual salary and paid assistant, his duties being to report, from time to time, the state of the various works belonging to the Corporation, to advise as to their repairs, renewal, situation, and effect, and to carry into execution the order of the Board. The whole work and duties of the district superintendents and offices are executed with his concurrence, and the entire system of drainage works are under his general control. Four superintendents also are annually elected, for the care and protection of as many divisions of the district, known as the Middle and South Levels. Each superintendent has once, at least, during each year, to view the public rivers, drains, banks, bridges, sluices, tunnels,

and other works within his division or district; he is to report, from time to time, all encroachments on the banks, and impediments to the passage of waters to their outfall; he is to order works to be done, enter into contracts, expend moneys, and all under the controlling direction of the engineer and the orders of the Corporation.

I consider that a general Act should embrace two distinct objects. In the first place, it should enable any drainage district to remodel, improve, reclaim, by empowering it to deal with every possible form of water-right for the common good—to execute works, to raise rates for payment, and to establish a permanently organized supervision for the maintenance or improvement of the whole system of water-works in that district. And, in the second place, it should provide for the case of isolated estates or farms, towns, or other interests, in districts not needing or not willing to combine in such general works or extensive supervision.

The bill introduced into Parliament in 1852, by the Earl of Carlisle, is the best attempt yet made towards framing such a law. Let this and the Irish Drainage Acts be studied, and a still better bill be forthwith prepared and brought before the Legislature. It may be some time before such a comprehensive measure is really carried: meanwhile, an Amendment of Lord Lincoln's Outfall Act of 1847 might be passed, and give suffering individual improvers in a benighted or factious locality the means of relief so much required.

In conclusion, I must declare my opinion that the country greatly needs the immediate appointment of a commission of inquiry, which shall examine and report upon the drainage condition of Great Britain, thus furnishing a body of evidence which would "prove the preamble" of a general bill, and by the description of cases and precedents enable principles of procedure in compensating and settling with conflicting claims, to be drawn up alike for the guidance of the district drainage boards and the central commission.

I am, Sir, yours truly,

JOHN ALGERNON CLARKE.

Long Sutton, Lincolnshire, Nov. 29, 1860.

A STEP FURTHER IN STEAM PLOUGHING.

Continuing our description of Mr. Fowler's new clipping drum, we must refer to the diagram given last month to illustrate its action. We have said that the amount of holding power from the frictional contact of the rope in a groove, is in proportion to the pressure of the rope against its sides; so that as the new drum has only 7 feet length of rope (or one half-turn) embraced in its groove, instead of 21 feet, which was the length found necessary for the old drum, three times the pressure per foot must be applied in order to prevent slipping. Accordingly, the span of the clips, that is the distance apart of their hinges or fulcra, is adjusted

so that the rope of the 10-horse engine, $\frac{3}{4}$ ths of an inch in thickness, compresses itself in every part of its course round the drum with a force of $3\frac{1}{2}$ lbs. for every pound of its own inward pressure; whereas the effective hold of the old V-groove, being simply derived from the inward pressure of the rope without leverage, was $3\frac{1}{2}$ times less. We have watched one of the new drums in operation upon a 10-horse engine, driving four furrows 7 inches deep in soil of medium tenacity, with 800 yards of rope running; and not the slightest amount of slipping occurred. But how does the rope bear such severe oppression? Judging by the eye, not

the smallest crushing or squeezing of the strands flat can be discerned; and tested by the callipers, no alteration of its circular form can be detected in the rope after so great a pressure. A 12-horse power machine, at work in Gloucestershire, is reported to have also demonstrated the sufficient capability of the new drum. That the wear of the rope in the new groove with moveable segmental sides is less than in the common V-groove is evident; because, instead of entering and leaving with a rubbing motion, the rope, as it were, takes the clips in with it, and when it is liberated they accompany it outwards; the clips moving in the same radial direction as the rope, while at the same time opening or closing upon it.

Are the parts of the drum liable to excessive wear? There is the least possible amount of grinding or cutting of the nipping faces of the clips, owing to their movement in admitting and delivering the rope from their grasp; and yet this movement is so slight, having a range of only about one-eighth of an inch for each piece, that the motion and wear of the clips upon the case-hardened pins upon which they are hung is very trifling. These clipping-pieces are the only parts of the drum subject to any wear at all (with the exception, of course, of the centre bush and the cog-teeth on the periphery), and, though 64 in number (consisting of 42 pairs each, taking 4 inches of the circle), can be supplied to the farmer at 50s. a complete set. There appears to be no special liability to derangement or breakage; and the drum is so constructed that its upper and lower flanges, carrying the upper and lower clipping-pieces, may be very simply adjusted by screw-bolts to different distances apart, in order to regulate the amount of pinching pressure on the rope and accommodate the clips to the several thicknesses of rope used for engines of various powers.

In our former paper we said that not only has the weight and complexity of the apparatus been reduced by the abolition of the large sheaves fore and aft of the boiler, but that the unsightly "jibs," or suspension-pulleys, with India-rubber springs, are no longer necessary. To prevent the rope "kinking," or doubling up between the drum and the small guide-rollers, it is requisite to have a slight pull or strain upon the slack rope while it is being paid out. If the ploughman could always draw up the following or trailing rope sufficiently by means of the small drums carrying the reserve coils of rope upon the plough-frame, the object would be attained. But as in practice this cannot be done, the "jibs" or suspension-pulleys were devised, which, holding up the slack rope in the air, caused it to tighten itself by its own weight, the outermost longer length over-balancing the innermost shorter length, and so giving it a tendency to run over the pulley and away from the drum, upon the same principle which induces a current through the shorter and longer legs of a syphon. Now, however, Mr. Fowler has applied an intermediate multiplying motion between the two rope-carrying drums on the plough, which, with self-acting ratchets, without any attention from the ploughman, constantly keep the railing and back rope at a sufficient

tension. In fact, the plough cannot advance until the hauling-rope has gathered up the slack to its proper tightness. An advance of the hauling-rope one foot gathers three to five ft. of the back rope; and if the length of furrow be increasing or diminishing, owing to an irregular shape of field, the rope is given out or taken up of its own accord, without attention from the ploughman, and without loss of time in the change. The rope being thus pulled off the drum under the engine, requires no mounting up by lifting pulleys, and thus the bendings over those pulleys are avoided.

The rope-porters adopted by Mr. Fowler have always been very simple, and easily shifted; but by way of relieving the labour of the boys, who have hitherto performed the shunting of the rope into its new track for each furrow, a self-acting rope-porter has been contrived. The return ply of rope passes over friction-rollers and through the hollow axle of a pair of wheels; and the straightening of the rope by its own tension causes these wheels to travel from time to time over the ground, being set upon the ploughed land so as not to impede the course of the implement. Of course this new rope-porter cannot be used on the rope before and after the plough.

We have to notice also another improvement, which will be of great advantage to farmers already possessing a portable engine. The simplicity introduced by the new clipping drum has enabled a cheap windlass frame to be constructed, on which the portable engine, without its wheels, can be placed. By just putting on a strap (which is covered from rain) the engine (without the least alteration or addition of working parts) drives the drum, and also the wheels of the windlass carriage, so as to be self-locomotive on farm roads or highways. As the price will be considerably below £300 for the complete set of ploughing and scarifying apparatus, the whole cost, when the engine is included, will be between five and six hundred pounds, much less than that of the self-contained engine, windlass, rope, implement, &c. Of course, it will be advisable to purchase the separate windlass only in cases where a good engine is already in the farmer's hands.

Essentially the steam-plough is now as perfect as it can be made; though, of course, no limit can be put upon improvements of parts and details.

THE GLEANER'S BELL.—Recently, at the ancient town of Great Wakering, in Essex, with some friends, I found the sexton or bellringer just about to enter the church tower for the purpose of tolling the bell. It was then on the stroke of six o'clock p.m. Thinking there was to be weekly evening service we proposed retiring, as we had come not to pray, but to pry into the curiosities of the place. The old man told us to stay, as he was only going to ring for the gleaners, and added that he did this regularly during harvest time at sunrise and sundown. Is this custom common to all counties of England? How far back may it be traced? And is it simply to be ascribed to the want of watches and clocks in bygone times? Or is there a sacred token of prayer and praise attached to it?—*Notes and Queries*.

HADLEIGH FARMERS' CLUB.

The proceedings at the Annual Root Show of this Society presented many points of agricultural interest. "Although the weights," says the *Bury Post*, "were not so heavy as usual, the quality of the roots was very superior to that of those which have been placed on the tables during the last four years. Considering the cold season we have passed through, which has been very unfavourable for such productions, it is astonishing that so much size has been obtained. In this respect they certainly did not come up to what have been seen at Hadleigh, nevertheless there was a pretty close approximation. The long mangolds were in weight far superior to the globes, the quality being about equal. In these classes there was never before so much competition. The swede turnips were generally exceedingly good, but those exhibited were not taken from those grown for a crop, having chiefly been planted with mangolds. A remarkable swede turnip, shown by Mr. Joseph Rand, attracted a considerable share of notice. It weighed no less than 22lbs., and for beauty of shape could not be surpassed. It was a solitary one in a field of mangold, the seed having been accidentally deposited there. The white turnips were produced in the natural way, and a better quality of this description of root has never been shown on these occasions. There was an extraordinary one, of the decanter species, forwarded by Miss Rowley, of Holbecks, which weighed 18lbs. The cabbages were very large, and some of them were of great weight."

The discussion at the "tea" was, as usual, of a high order. Mr. POSTANS, referring to the award of the judges, and speaking for himself and colleagues, said there was a greater disproportion in the weight and quality of the roots than the judges had expected to see, and he therefore had made two classes of the mangolds. There were altogether 24 acres shown—twelve 2-acre pieces, and he divided them into sixes. He put the six lightest weights by themselves, and the six greatest weights by themselves, and he would now state the result according to their weights, beginning at the lowest. Of the mangolds the lowest in weight were those of the Rev. Arthur Wallace, of Monk's Eleigh: they weighed only 15½ tons. The next highest weights, they considered, were those of Mr. John Cook, of Hadleigh: the judges did not weigh them, for they saw they were much lighter than others they went over—they calculated them to be about twenty tons per acre. The next were Mr. Robert Hawkins, of Milden Hall: these they did weigh, and they came out 21 tons 4 cwt. The next were Messrs. Rand's, which were of very nice quality, and grown on a high piece of land at Layham—they weighed 21 tons 17 cwt. The next Mr. Samuel Kersey's, of Hadleigh—24 tons 8½ cwt. Then Messrs. Rand's, at Ivy Tree Farm, 24 tons 17 cwt. These were the six lighter pieces. Dividing the totals by six, they came out on the average 21 tons 6 cwt. to the acre. They estimated them to come out on their nett weight, without their tops, at about 16½ tons per acre. He would now give them the weights of the six best. The lightest weight, which he would begin with, were those of Mr. Phillip Mason, of Dedham, 25 tons 18 cwt. The next were Mr. John Vince's, of Hadleigh: they were of very beautiful quality, grown on a very good piece of land, and they came out 30 tons 1 cwt. Their nett weight was 24

tons 4 cwt.: they were particularly light in the tops. Then came Mr. Walter Strutt's, of Groton, which came out exactly the same weight per acre, viz., 30 tons 1 cwt. Messrs. Rand's, of Layham, on their fen farm, came out 32 tons 11 cwt., the nett weight being 23 tons 9 cwt. Those of Wm. Gurden, Esq., of Brantham, weighed 32 tons 13 cwt., about 2 cwt. more than Messrs. Rand's in the gross: their nett weight was, however, 25 tons 5½ cwt. Mr. James Norman's, of Layham, weighed 44 tons 3 cwt. (Applause.) He ought to have stated, but had forgotten to do so, the number of roots to the rod. Mr. Vince's numbered 80 roots to the rod, Messrs. Rand's 71, Mr. Gurden's 90, Mr. Norman's 93. He thought there were 102 or 103 on one rod and 83 on the other, of Mr. Norman's, so that they were rather dissimilar as to their quantities. They were very full of growth. He (Mr. Postans) had the curiosity, a month after the judges had looked them over, they being very near to his, to see how much they had increased in the time. He found in the root they had increased upwards of three tons, and very little in their tops, which had begun to wither. He thought it was worth while to mention this to the society, thinking it might be interesting to some of the members in reference to the question whether they might not keep their roots growing longer than they sometimes did. (Hear, hear!) The average weight of the six heaviest pieces with their tops was about 32 tons 11 cwt.—without their tops about 25 tons. Mr. Joseph Rand, he dared say, would have noticed as to the two pieces of mangold on his fen land, that there was a great disparity in the weight of roots alone, when they were without the tops, between his and Mr. Gurdon's—very nearly two tons per acre more of roots on Mr. Gurdon's, with very little more weight in the gross. This the judges thought an essential matter, as the root of course was the most valuable part, and Mr. Gurdon's roots were superior to the others; and they ought also to make allowance for Mr. Rand's being grown on fen land, for they always came much coarser on fen land than on upland. They awarded the first prize to Mr. Norman—they were of course well cultivated—(applause)—and the second prize to Mr. Gurdon, which he (as having offered the prize) consequently gave to himself. (Applause and laughter.) As to Mr. Gurdon's transplanted mangolds, he wished to mention that the judges did not find them so heavy as others, nor so good. He forgot what was the exact difference in the weights, but he thought it was about three tons between the transplanted ones and the others. The transplanted ones were three tons less, and had more fibrous roots on them, and they were not so clear of small roots as the others, and the judges certainly did not think them so good. Mr. Gurdon would perhaps have something to say upon this by and by; but he had thought it best publicly to express the judges' opinion. He made the weight of Mr. Gurdon's transplanted ones 28 tons 10 cwt. with, and 22 tons 2 cwt. without their tops. He now came to the swede turnips. He had classed these just as he had done the others, beginning with the lightest weights. The lightest they found were Mr. Wallace's, of Monk's Eleigh, which came to about six tons per acre. They then saw some very good roots at Mr. Tiffen's: they were grown upon the ridge; but being at great distances, the same as mangold wurtzel, and very

thin, the plant did not come to much weight. They were very good roots—the largest, in fact, that the judges saw; but they weighed only 10 tons 3 cwt. per acre; this was certainly owing to their being so very thin in plant. The next were Mr. Gurdon's—11 tons 13 cwt., with their tops. The next, which won the prize, were Mr. Jas. Norman's, they weighing 19 tons 13 cwt. They were not very well hoed out, and in an ordinary season the judges would not have thought of giving them a prize at all, as they were no great weight; but when they came to consider that they weighed nearly three times as much as the first, and that the season had been so very adverse to the growth of roots, they thought the prize ought not to be withheld from him, therefore they gave it to him for his Swedish turnips. He now came to "other kinds of turnips." The first on the list was a piece of Mr. Tiffen's: they were called the Scotch pudding turnip, and were put in very late, and had not had time to make much growth, and their weight was only 15 tons. The next were Mr. Gurdon's; they came to 20 tons 13 cwt. He should tell them that these turnips were grown after mown tares, and the judges thought there was a great deal of credit due to the manager of that estate for getting so good a piece of turnips in such a season as this after mown tares. The next were Messrs. Rand's, at Peyton-hall—24 tons 5 cwt. The next Messrs. Rand's, Layham—24 tons 10 cwt.—and these took the prize. They were of the bell decanter kind (Mr. Thos. Hawkins' stock), of excellent quality, and full of growth: no doubt by this time they weighed three or four tons more than they did when the judges saw them, for they were then growing well on the land and were in fine condition.

The CHAIRMAN said that, from what Mr. Postans said, it seemed the judges were most astonished at the roots after mown tares; perhaps, therefore, Judge Gurdon would explain his mode of cultivation.

MR. GURDON thought he must ask the indulgence of the meeting to be allowed to call on Mr. Garnham, his bailiff, to make the statement, for he himself had so little expected, under any circumstances, to be the winner of a prize that evening, that he was not exactly prepared with the particulars, and Mr. Garnham could state them much more accurately than he could. He did not think Mr. Garnham had put him to any great expense: he would tell them now what he did for the tares, which was the first thing.

MR. GARNHAM was afraid that he should be unable to give them very much explanation as to the treatment for turnips. He thought the tares were first ploughed for in September, with a coat of farmyard manure—about twenty loads per acre. They were mown off early for horses, and many of them cut into chaff with rye. Afterwards the land was broken up, subsoiled, and scarified, and about 2 cwt. per acre of superphosphate sown, and the turnips put in. This was all that was done with them. As to the mangolds, he broke up the land as soon as he had done wheat-seeding, it was then late in the spring. He then put in 13 or 14 bushels of lime per acre, with the "manna" taken off the bank spread on the field. It was crossed and subsoiled in between the ridges, then ploughed in, and about 12 loads of London manure put in per acre without any artificial.

MR. GURDON would add a few words respecting the mangolds, as this root had been rather his hobby-horse for the last two years. He did not hesitate to say that he had always considered it a most valuable crop. Though, as the chairman had said, he (Mr. Gurdon) was a very young farmer, he believed that many old farmers were beginning to think that he was not very much wrong in that respect;

he believed that some of the best farmers in the present day were still more anxious than ever to try to grow a good crop of mangold. They had met with many difficulties, and a young farmer might be excused if he could not surmount them; but he would say to them, "get up early, and don't be behindhand." He had a very good bid for his last year's mangolds, and they went off to Scotland, and he did not know that this circumstance did not do a little harm, as the boat which came down with the London manure came just at the time the mangolds went off, and they had to load the one and unload the other with rain on them, and they were fairly three weeks too late. That was the secret, he thought, why the judges had found his mangolds growing with an enormous quantity of top, such as they ought not to have had at that time of year, if they were ripe enough to take up. He believed, if there had been a month's more season, that the mangold might have gone on, and though it would not have reached the weight of last year (for that could not be expected with such a season), he had no doubt that with warm weather, such as they usually had in this kingdom in autumn, with a temperature up to 60 degrees, he should have had a considerable increase on the 25 tons. With respect to the transplanting, he might mention that last year some of the members of the club did him the kindness to go over to Brantham, to see with their own eyes the effect of it. Mr. Rand freely admitted to him, when he saw his mangolds, that they certainly were far beyond his expectations. Let them not mistake him by supposing that he had ever advocated the idea of growing a whole crop by transplantation; what he wanted to ascertain was whether they could transplant a root, keep it of good quality, and make it of good size and weight. This year only satisfied him that he was more and more correct in his conviction that it could be done. He was satisfied that transplanted mangolds might be grown to advantage, profitably, and to a very considerable size. He had tried the experiment now for three years, and he saw little reason to doubt, at any rate after such a season as we had had, that transplanted mangolds might be grown almost the same weight as those which had been shown. Mr. Postans had said that the judges weighed the transplanted against the sown ones; he wished Mr. Postans would tell them whether he considered he took one rod out of the transplanted and one out of the dibbled.

MR. POSTANS said they took three rods altogether, two out of the dibbled, and one only out of the transplanted.

MR. GURDON said he unfortunately was not at home when the judges came, but on examining one of the spots where they had been, he observed in one row they had taken a square rod, and they had taken two rows out of about six or seven of transplanted ones. With respect to the transplanted ones, Mr. Postans would see that there were altogether as nearly as possible an acre, but he had not good plants for more than a quarter of an acre. Mr. Garnham was anxious, having got some plants raised in the field, to use them. They were not raised as they should have been, with proper mould. He went on planting, but the plants consequently were faulty, and were filled up subsequently after an interval of a fortnight or three weeks. Thus they got about six weeks too late; so this year should not be taken as a specimen of what could be done by transplanting. Let any gentleman who had any doubt about it try for himself, and next year get some nice loose mould mixed with vegetable-mould. It was necessary, if they wanted a root for transplanting, to plant it in a loose soil, as they threw out a great quantity of fibrous roots. Don't break any of these, as if they

did they would not go on well. But if they were grown in a stiff loamy mould, whatever muck they put under it forced it, and it would be only a puny thing with a single tail; break off the end of that, and then there was no other absorbent to take the nourishment up. Many of his plants this year were of that character, which arose from the gardener taking the soil of the field—a stiff loam, almost clay. It would not do to raise the plants in that. Then, as the judges saw, his field was in a wretched state. It only showed the advantage of good over bad farming. He had no hesitation in saying that in a slight degree Mr. Garnham failed; but it was a very badly-farmed field this year, as full of water as it could hold. As they knew, the field sloped down to the river; near the house the soil was of a very porous character, sand, into which, when there was water, it easily filtered. A portion of that field was like a volcano of running lava almost, running down with the water which forced itself out of the top of the hill, and it was almost impossible that anything could grow on that. He was really ashamed to take the sovereign which had been awarded to him, and he therefore begged to return it to Mr. Grimwade, and hoped next year some one would receive it who deserved it much better than he did.

Mr. POSTANS understood from Mr. Gurdon that the judges had made a mistake, and in taking the transplanted mangolds had only taken two rows from the transplanted ones. They went where they were directed, but if they had taken five rows of those grown after being dibbled, and only two of the others, of course they ought not to have made the comparison.

Mr. JOSEPH RAND said the President had asked him to make a statement how he produced his white turnips. He did not know how he could state anything beyond the usual culture for them as near as he could judge. He made a good fallow by the usual ploughing; he ploughed up early after harvest—it was after barley. Then he gave it a ploughing as soon as he could in the proper season. After an interval he gave two crossings, and then only stetched it up once. Before he stetched it up he gave it farmyard manure—by no means a heavy coat, only seven tons per acre of well-made farmyard manure; but he attributed the result quite as much to its being a good stock of turnips as to the cultivation. For quality he never saw better; and he never found his sheep thriving more than at the present time. He had named at these meetings, three or four years in succession, that his description of turnip was the very best one to grow for early feeding, both for quality and quantity: the “bell decanter” he thought was the proper name. He believed for the introduction of that stock he was indebted to this society, who recommended him to grow it. The advice to try it came from Mr. Thomas Hawkins, who furnished him with his first seed, and he had kept the stock ever since, now 13 or 14 years. As he had said before, they were very valuable for early feeding, and for ten out of twelve years these turnips had taken the prize both for acres and half-dozens; therefore he recommended gentlemen who wanted early feed for stock by all means to try it. With regard to mangolds, Mr. Postans had said Mr. Gurdon and himself (Mr. Rand) had come very near indeed as to weights, when the tops were included. Some one had said that the tops were of very little value. Now he himself set much greater store on them than many people did, and he thought it rather lucky for him that his land produced a large quantity. Where he produced the mangolds to compete this year the land had been in mangold three years in succession (Hear, hear). All he did to

the land this year was to stamp the leaves in (there were twelve tons an acre, according to the judges last year), and he fed some sheep on it. He fed his sheep with other food besides leaves, but he did not carry a handful of manure for this last crop: he congratulated himself that the leaves were very good and rich manure, particularly if mangold wurzel was grown after. The mangold leaves returned back to the mangold exactly what the mangold plant required, and he believed them to be productive of a considerable portion of the weight he obtained this season. There was another thing. Going to judge mangolds as he did five or six weeks since, he would state that where there were plenty of leaves on the mangolds, if there was open weather, the more crop they would get. If they watched the crop as he had done, after he had set out for the half-dozens, and took a string and meaasured one which had the greatest quantity of leaves, that would be the mangold to increase most in open weather; he believed he had tons and tons more per acre now, six weeks afterwards, than when the judges inspected them. He was reading a letter in the *Times* a short time ago from an eminent chemist (Voelcker, he thought), who made a statement that mangold leaves might be preserved with great advantage by salt—in fact, a regular pickling; a layer of mangold leaves salted down with a layer of salt would prevent decay; they might cut it up with other food for cattle, and it would be found very useful. Whether it was so he could not say, and he only gave his statement: the Professor added his reasons and proofs; he must mention that he finished his letter by saying it was a question whether it would repay the labour. He (Mr. Rand) must say that no doubt it would be a great expense to take them up, clean, and preserve them. If it was so, perhaps he should find the leaves of more value yet than he had hitherto done; therefore he himself thought even with twelve tons of leaves found in his piece last year he could not complain.

Mr. ROBERT HAWKINS asked Mr. Rand what he fed upon his land to produce his beautiful crop of mangold—whether there was no cake used on the field or any part of the previous mangolds used on the land, as he could not account for tops only producing such a crop?

Mr. RAND said it was perfectly true that he fed with cake and tops too, and nearly half the mangold produced the year before (Laughter).

Mr. HAWKINS: And a capital preparation too.

The CHAIRMAN asked Mr. Sheldrake how he cultivated his land to produce such excellent cattle-cabbage as he had shown that day. He himself had grown some, but they were small in comparison. What time did Mr. Sheldrake plant them, and how did he cultivate for them?

Mr. SHELDRAKE said, in taking the prize for cabbages that day, he must say he had done what he had never done before, but it was a legitimate proceeding—that was, he cultivated in a garden. He had several rods of ground in his garden, and he planted something like five or six score of cabbage-plants, and gave them plenty of good farm-yard manure; and once, about the month of June, he watered them with liquid manure. He did not know any other preparation than that, or that any other was required. If anyone had had any good ones there, he thought he should not have had the prize, as his cabbages weighed only 90lbs., and he thought it somewhat disgraceful to show a half-dozen not weighing more than that. He could only sum up all by saying they could not farm against seasons.

Mr. GRIMWADE read a letter from Mr. Robert Cobbold Perry, who had entered some roots, but in consequence of his balliff being very much engaged, he could not send

them. He said, "We, gentlemen, are not always our own masters, for, as I wrote you word, it was my own and my man's intention to have forwarded some beet and turnips for show, but my man was so put out with the weather, and he was not able to get his beet-root up, and his wheat in, of which he had nearly sixty acres to dibble, that he could not attend to shows this year; therefore I should not be much surprised if they were not sent; and I have not been there since Saturday last. I can tell you how the beet was grown, and it was the best piece about. The land was ploughed the middle of the harvest 1859, and laid until the spring, when it was split open, and about fourteen loads of good farmyard manure put on. The turnips were ploughed for in the spring, and drilled on the ridge with muck. I think they were hoed three times; but they are fair for the year, and will be clamped this year. The rotten muck appears to do better than that out of the yards (long-muck). P.S. I do not know whether it is generally known, as I gain it privately, that a great part of the butter consumed in Australia is sent out from Ireland and England packed in tin cases; therefore at present it must keep up."

Mr. GURDON said he should like to make one observation. He thought Mr. Partridge would remember that he said at that table last year he thought his (Mr. Gurdon's) mangold would have been better if, instead of growing it thirty inches from row to row, and thirteen from plant to plant, he had grown it twenty-seven and fifteen inches. He took his advice this year. He did not know he was at all wrong as to twenty-seven inches, but he wished he had planted it thirteen from plant to plant, as he had lost two-fifteenths in the number of plants. With the smallness of roots this year he had a great loss. If they had been large roots, Mr. Partridge's would have been good advice. If they asked him, he would stick to twenty-seven inches; and fourteen inches from one plant to the other. He thought fifteen inches more than sufficient. If there was a year of small plants, they had a number of plants to make up; whereas if there were a few plants, and it turned out a year like this, then they were left behind. With respect to dibbling, he believed Mr. Garnham would tell them that the moment he got the dibble from the blacksmith he sent his drill home; and he thought that nothing would persuade him to use the drill again. He thought a man would be able to dibble six acres in a day. They knew what the cost a man would be to drag the wheel; he was accompanied by four boys to assist, and these five could do six acres a-day: and half the seed was sufficient—2lbs., instead 4lbs. Putting the seed at 1s. per lb., there was a saving of 12s.; and he left it for more practical farmers than himself to say what was the result of that, in point of cheapness, between a drill and horse, and two men to attend the drill. Let them set one against the other, and look at it in a pecuniary view. He was sure the dibble was an instrument which would hereafter be generally used for mangolds. He had, however, seen a gentleman this year from the Ipswich Club, who had told him he had tried the dibble, and given it up. He (Mr. Gurdon) tried the dibble with a cone last year, and did not like it. This year, instead of having a round cone, he had a blunt edge, three inches long.

Mr. POSTANS was quite sure Mr. Gurdon was correct in what he had said about it having been an advantage this year to have plants rather thicker than usual; he found this was the case with Mr. Norman's. His were all drilled, put in very regularly with the drill. There was a great difference in the way in which seed was put in by the drill. Mr. Norman's drill was one of Pratt's: this dropped the

seed in a regular manner. He thought it was not generally an advantage to be too sparing in seed. With respect to Mr. James Norman's, the number of roots was found to be 102 or 103 in the red: this would in some measure account for the great weight he had: as the roots this year did not grow to the usual size, his being thicker than others who had exhibited, accounted for the increased weight. Most of their neighbours he thought had exploded the dibbling system in the common way, making the round cone, especially on land rather heavy. Where they made the round cone on land which happened to be wet, a considerable quantity of water came up, and the whole of the plants came up yellow and weak. He thought the plan suggested by Mr. Gurdon an excellent one—to use an instrument making a hole in a wedge-like form.

The CHAIRMAN said most of those present probably had suffered this year from the disease in potatoes, and perhaps at this moment some of them had very few. He heard from many growers of potatoes, who had made considerable money in the trade, that they found that the fluke potato (none of which had been exhibited that day) appeared to be the least diseased of any sort grown. They had heard a great deal of the Scotch potatoes that had arrived both at Ipswich and Colchester, and that they were not diseased; but a lady who had bought some at Ipswich told him that, out of a sack, before she consumed them, a great number were diseased; therefore, they must not believe all they heard about those imported, but at the same time some were very good ones.

Mr. GURDON said his flukes were the only sort not diseased this year.

The conversation here became complimentary, and the meeting shortly afterwards broke up. If farmers would, however, always speak out as they did at Hadleigh, what stores of practical information would be opened up!

FARMERS' CLUBS IN THE EASTERN COUNTIES.

—A great number of agricultural gatherings have recently been held on the eastern side of the country. The Coggeshall Farmers' Club used to be generally rendered rather famous by a discourse from Mr. Mechi; but this year the worthy Alderman failed to put in an appearance, and the great authority of the evening was Mr. Fisher Hobbs, who, in reply to a question whether he considered that land dug with the spade to the depth of thirteen or fourteen inches was in a better condition than land ploughed to that depth with a steam plough, said at present there was a great diversity of opinion as to the best mode of applying steam-power to the cultivation of the soil; but he believed everyone would admit that at all events for root crops the deeper land was broken up the better. The Coggeshall district was a neighbourhood in which spade husbandry was carried out to the greatest advantage; but, of course, if the furrow-slice was turned over, it did not signify whether it was done by manual power, by horse-power, or by steam. If the implement was the same, and would turn the furrow-slice over at the same angle, there was little difference, except that horses trod the land down the most. The great advantage of steam was that it enabled farmers to do a greater amount of work at one particular period of the year; and he had no doubt that ultimately steam-power would be used soon after harvest, for eighteen hours out of the twenty-four. In Suffolk the farmers' clubs appear to be very numerous—meetings of this description having been held at Ipswich, Framlingham, Hadleigh, Eye, and Debenham. At Eye, Mr. R. Bond came out with a paper on "The Past, Present, and Future of Agriculture." At Ipswich, Sir Fitzroy Kelly did not turn up; but the chair was well filled by Mr. Manfred Biddell, and a pleasant and instructive evening was spent.

RIVER OUTFALLS AND DRAINAGE.

BY A LINCOLNSHIRE FARMER.

I am very pleased to learn that a movement is to be made this winter to interest and influence the Legislature upon the question of "Arterial Drainage," or rather the improvement of our river outfalls, and the removal of obstructions to the free course of our river waters. I have long felt a great interest in this question, as one of the great wants of the age. It is marvellous that amidst the immense improvements of all kinds now proceeding in modern agriculture—and amongst the most important is that of drainage—the state of our rivers and outfalls has been for the most part over-looked and neglected, or at least passed by as too weighty and onerous to be undertaken, owing to the many conflicting and powerful interests to be encountered. We have *mill-owners, canal companies, corporative rights, navigations, irrigations, the owners of meadow lands* (said to be benefited by flooding), *proprietors*, dreading Boards of Commissioners; and taxation, and the various other interests to contend with. These can never be brought into unison so as to combine for one great purpose, or to adopt any sound substantial scheme, by which the whole country may be enormously benefitted, but are still each contending for some petty advantage of their own.

I met the other day with an occupier of a farm bordered by the river Nene. His statement of returns from land reclaimed from its influence was astonishing. The crops heavy and productive almost beyond credence, and yet everything is annually sold off. Corn, mustard, hay, straw, mangolds, potatoes, turnips, carrots, cabbages—all are sold off, and nothing is brought in return to replenish the soil. This is owing, as he said, to the great depth of the most fertile and richest loam imaginable. In fact this occupier (and he was the proprietor too) deems such extraordinary land inexhaustible under cleanly management and with proper rotation of crops.

Now this is the kind of land by which more or less all our rivers are bounded, and that if they were well drained, would yield enormously. The meadow crops certainly are good when they can be well got. The winter's flood no doubt does essential service, but how frequently is the crop lost from the summer's flooding! Suppose these lands to be made safe lands by efficient draining, can the hay crop compare with the succession of crops named above? And carrying the idea into all tributary brooks and streams, and the lands by which they are bounded, see what losses ensue from imperfect drainage along their course—aye, quite enough to interfere most wofully with good practical farming and grazing, and that, even at considerable elevations above the course of our rivers. Take the simple fact, for instance, that the sources of all our rivers are invariably at a much higher elevation than the outfalls; then, that the waters are further held up by numerous mill-streams,

bridges, locks, and weirs—who can wonder at injuries sustained, up the higher parts of a country, from the bad state of our rivers? And who would not come forward and aid in their improvement? When young, I was desirous of establishing ideas in my own mind which might lead to a consistency of conduct. I used very frequently to repeat the old distich—

"We habits gather by unseen degrees,
As brooks run rivers, rivers run to seas."

So it now is, in fact. The ill habits of our brooks, in damming up the waters that ought to flow freely from our underdrains, is, by their incapacity to empty the ditches, the first obstruction. Then, from the brooks into the streams is another hindrance; from the streams to the rivers is the next; and often on these smaller streams there is obstruction by mill-dams—and so from the rivers to the seas. These rivers are, as I have said, always being stopped, in every convenient spot, by a mill-dam, staunch, lock, or weir. The little river Nene, according to Mr. J. A. Clarke's "Report on Arterial Drainage," has no less than fifty-one mill-dams and staunches along a course of sixty-three miles—the distance of its tortuous course from Northampton to Peterboro'—and having a fall of 226 feet between the two towns. With what rapidity would its waters escape were these done away with, and the river straightened where practicable! Many sudden bends do not extend beyond a few hundred yards.

As respects the advantage of efficient outfalls to our rivers, let any incredulous individuals pay a visit to *the estuary of the Wash*. There they will see two splendid outfalls—one being the embouchure of the Ouse, the other of the Nene, emptying their waters so satisfactorily, that almost the whole of the great level of the fens is now under efficient natural drainage. The Welland and the Witham have also greatly improved outfalls; but a few artificial aids to drainage still exist in the districts drained by these rivers. Some years ago it was a novel and interesting sight, when travelling over the fens, to behold hundreds of windmills, in a brisk breeze, driving out the waters by enormous water wheels, from the lesser into the main drains, and thence to the rivers. Now scarcely one is to be found in the whole level. And why? Because the rivers have been straightened and deepened and provided with wide and straight outfalls into the sea. The great disadvantage in effecting these improvements was owing to the amazing expense of obtaining Acts of Parliament. The whole level being divided into districts, every one had to secure its own Act of Parliament. The opposition in these various districts was often frivolous, but it incurred immense costs, and much bickering and illwill amongst neighbours. How much better would it have

been, and what an astonishing saving in expense would it have been, had one general act been obtained, leaving the details to be carried out by the local authorities! This is the very thing wanted in the present day—a general Act of Parliament empowering local boards of commissioners to carry out improvements in rivers and outfalls. Of course any such general act must be guarded in its provisions by the usual provisos; so that every interest shall be fairly represented, and nothing be done without the sanction of a certain and influential body of owners and occupiers along the course of the rivers. We have many Acts of Parliament which might, under supervision, be taken as models. Lord Lincoln's general Act for Drainage of Small Districts is under the direction of the Enclosure Commissioners for England and Wales, and is a good example. Every fen-district has one, describing the course to be pursued in commencing and carrying out a system of drainage-improvements. There can be no difficulty in framing a general Act of Parliament for such purpose. That one is needed we have only to take the present season in instance. What a large extent of low land bordering on rivers and streams is at this moment lying under water! And what losses occurred during the past summer along the course of every river, that need not to have taken place had the waters free course! It may appear rather hard to interfere with the water-mills, so as to cause their removal, or to convert them into steam-mills; but in these cases the owners must

be compensated. The great thing to be considered, in every case, will be the ultimate advantage; and when we know the prevention of injury by flooding—the reclaiming of large tracts of the prime land in the kingdom—the sanitary improvement of the country—the advantage to navigation—and the many minor improvements to be carried on up every brook and stream, to the benefit of subsoil drainage, it must be manifest that great good will ensue to the community, far beyond individual losses, which must ever give way to public benefit. Take the flooding alone within the past ten years. What woeful damage have the floods done! In 1852 those of the Severn and Wye caused immense injury. The vale of Gloucester was one wide sea. Worcestershire suffered much; Wilts and Berks were equally bad; Northamptonshire, Lancashire, Nottinghamshire had unheard-of losses. And again in 1853, Cambridgeshire, Essex, and Norfolk, were in a woful state, many thousands of acres being under water, and the produce swept away: the Trent to the Humber was one vast flood. In Kent, Surrey, and Herts much damage was done. And this is, no doubt, the case at this present time—such continuous rains cannot fail to have caused disastrous floods wherever the localities are subject to them. It cannot be too strongly impressed upon the Legislature that the satisfactory fulfilment of a wise system of arterial drainage would be of immense advantage to the country; and I trust we shall soon see it accomplished.

THE EFFECT OF THE LOW TEMPERATURE AND HEAVY RAINFALL.

SIR,—It may be useful to examine the influence of the low temperature and excessive rainfall of the last spring, summer, and autumn on our present and future supplies of meat.

The cold late spring of 1860 was seriously prejudicial to the breed of lambs. In the large sheep-breeding districts of Hants, Wilts, Dorset, and Sussex, and in the Romney Marsh and adjacent country, the produce was very considerably below what, in the absence of accurate statistics, may be considered an average. The season was equally prejudicial to the ewes, and amongst them the mortality was unusually large.

The high prices of mutton and beef from April onwards have demonstrated the shortness of the stock on hand, and the unfavourable character of the spring for the production of meat. The high prices may also be assumed to have led to the early and premature slaughter of animals usually held on till a later period.

The summer, when meat is ordinarily most readily produced, brought no remission of price. It was not until the middle of September that the Smithfield and country markets indicated by lower rates that they were more liberally supplied. At first sight this reduction of price would appear to be a natural and healthy consequence of increased production. The real cause probably lies, unfortunately, in another direction.

The sunless wet and cold weather has undoubtedly

affected the nutritive quality of the natural and cultivated grasses. Those fed off during the summer have been wanting "in proof" (to use the grazier's expression), whilst a large proportion of the grass crop converted into hay has been most seriously injured by the continuous rain. The root crops are equally, perhaps more, injuriously affected by these causes. On the soils most favourable to the swede turnip and mangold wurzel, on which reliance for feeding purposes is now chiefly placed, the roots are singularly deficient in bulb and quality. On the heavier soils, particularly where undrained, the crop is scarcely worth the trouble of storing.

These conditions have compelled the breeder of sheep to sell more heavily than usual, and in the same proportion they prevent the ordinary buyer making his purchase for grazing for the spring and early summer supply.

Again, in the rich marsh lands of Somerset, in the usually safe pastures of Dorset and North Wilts, and in the Sussex and Romney marshes, where during the autumn mutton is usually rapidly and abundantly produced, the anticipation of rot, or the disease itself, is so prevalent that, instead of being buyers of sheep as usual, the farmers have in some cases prematurely forced their entire stocks into the market.

It is obvious, if these assumptions have any accuracy,

that the present comparatively adequate supplies of beef and mutton are but the precursors of grave future scarcity. The fine season with which Scotland and the North of England have been favoured will possibly mitigate the consequences which may be expected to arise from the untoward weather of the South.

Something, at least, may be gained by an early examination of our prospects in this direction. Farmers with a short crop of roots or bad hay may be induced

to keep the cattle and sheep, for which they apparently have insufficient food, by going more deeply into artificial feeding stuffs, if an unusually high price for beef and mutton may be anticipated in the spring. Further, an early appreciation of our future wants may enable our continental neighbours to send us more cattle and sheep than heretofore, and thus a more equable supply of food may be looked for. Your obedient servant,

A SOUTH WILTS FARMER.

THE PURIFICATION OF WATER FOR CATTLE.

SIR,—I have read with much interest the letter of your correspondent signing himself "X. Y. Z.," upon the above subject, and trust you will allow me space for a few observations upon this important question.

For many years back my attention has been exclusively devoted to the purification of water; and, although I cannot claim the merit of being the first discoverer of the extraordinary efficacy of animal charcoal in this process, I was the first to adapt it exclusively and in a practical form.

The Patent Moulded Carbon Company are now working out one of my earlier patents, and in my most recent one, to which your correspondent alludes (without, however any mention of my name), I have introduced improvements which overcome the tediousness and costliness of my first process, besides possessing other important advantages over my first plans. I will not here attempt to follow your correspondent in his remarks upon the injurious effects of impure water upon cattle.

About this there can exist no doubt in the minds of any one who has bestowed a moment's thought upon the subject, and who is ever so slightly acquainted with the striking facts which our sanitary reformers have been at such pains to make known. To what your correspondent has said upon this point, I will merely add, that the substances with which water is contaminated are very various, some being highly prejudicial to animal organism, and some quite innocuous, if not beneficial; and that animal charcoal, although a positive specific against organic matter (the most frequent and fatal of all the contaminating substances) is wholly inoperative upon many of the others.

Those who are sufficiently interested in this matter to desire to pursue it further, are referred to the able publications of Doctors Lancaster, Letheby, and others, and they will find the whole matter popularly treated in a little work upon "Water and its Contaminations," upon which I am at present engaged.

Your correspondent very pertinently dwells, when referring to the well-known preference of some cattle for impure water over other apparently pure and bright, to the extraordinary force of habit, and illustrates this point by a reference to the preference of the aborigines of New Zealand for stinking over fresh animal food. It may be interesting to your readers to know of a similar fact near home. In the course of a long residence, some time ago, in the interior of Germany, I was astonished to find that whereas fresh sea fish, when obtainable, was thought little of, it was much relished when in a state of decomposition, which would have rendered its use in countries nearer the sea quite impossible.

I may also add that my experiments have confirmed an

idea which struck me when reflecting upon this strange preference of cattle for impure over apparently pure water, and that I have found such preference to be frequently well founded, the muddy best liked containing merely earthy admixtures of a comparatively harmless character, whilst the rejected water, although clear and bright, I have found to be contaminated with substances highly prejudicial to health. Such of your readers as remember the terrible ravages of the cholera in the district about Golden-square, where the inhabitants were at considerable pains to procure the clear bright water of the Broad-street well, will not be astonished at this fact; in which we have another illustration of the occasional inscrutable superiority of animal instinct over the reasoning powers of man.

Your correspondent alludes to the progress which this question of purifying the water for cattle has made amongst the metropolitan and suburban dairymen, and to the apparatus used for this purpose, and recommends the adoption by farmers of similar means, which he thinks may be readily provided by each individual for himself. His information is evidently drawn from a little circular issued by the exhibitors of my apparatus, at the Canterbury meeting of the Royal Agricultural Society, and probably from a personal inspection of it at that show, and I think it would only have been fair had he acknowledged the source from whence he derived his information. This has probably been an unintentional omission, and in any case I readily forgive it, in consideration of the able manner in which he has called attention to this important subject. I may, however, be permitted to remark, that to myself is exclusively due the credit of having brought out the first, and, so far as I know, the only agricultural cattle filter, and of having been the earliest practical applier of the purifying process to the water supplied to beasts. My apparatus is the only one in use by the metropolitan dairymen, and, I have little hesitation in saying, is the only one adapted to their requirements.

The Agricultural Engineers Company of London exhibited my patent portable agricultural pump filter at Canterbury. By means of it the most impure water to be obtained in the neighbourhood, coloured a deep red with logwood shavings, and rendered still more offensive by the addition of hydro-sulphate of ammonia, was pumped up perfectly brilliant and pure, and free from all offensive smell, to the astonishment of the crowds who were daily collected round the stand, and who freely drank it when filtered. To such of your readers as had not an opportunity of then inspecting it, I may remark that a similar one can be daily seen in operation in the warehouses of the Agricultural Engineers Company, Swan-lane, London Bridge, where any information as to its application can be had.

To the remark that any farmer can adapt the same means himself to the purification of the water for his cattle, I may observe that my last patent secures to me, amongst other things, the exclusive right to the use of all mechanical powers for the conveyance of water through the filtering medium: that since the water in most farms is derived from ponds or reservoirs sunk below the surface of the surrounding ground, such mechanical power is necessary; and that even if no such impediment existed, it could no more be expedient for each individual to make his own filtering apparatus than it would be to manufacture his own plough or thrashing-machine. I make no secret of the process I use, which was fully described in the circular I refer to, and am so confident of the advantage every one will find from having the process worked out by a competent person, with all the facilities of knowledge, experience, and mechanical appliances at his command, that I will be happy to afford, to such of your readers as desire to try the experiment of manufacturing for themselves, any information in my power as to the best means to adopt.

As yet this question is in its infancy. Each day will add to the number of believers in the necessity for the extension

to animals of the well-known sanitary rules now applied to man; but the early practical appliers of their belief in this, as in all other affairs of progress, will be comparatively few: and it will be only from finding in the most unmistakable way the exemption from epidemic disease and improvement in condition of the cattle supplied with pure and wholesome water, that I can look for any general adoption of my views.

With this belief, I would earnestly impress upon the minds of those advanced agriculturists, to whose unselfish and untiring efforts the proud position of British agriculture is so much due, the desirability of instituting a series of experiments conducted on such a scale and in such a manner as to be convincing to the convictions of their less advanced brethren, in which good work I will gladly offer my most strenuous co-operation, and in which I venture to hope for your powerful advocacy and assistance.

I remain, sir, your very obedient servant,

F. DANCHELL, Civil Engineer.

9, Great Queen-street, Westminster, Nov, 1860.

PRODUCTION OF VALUABLE MANURE FROM THE AIR.

BY MM. MARGUERITTE AND DE SOURDEVAL.

The value of guano and most other concentrated manures consists to a considerable extent of the ammonia which they contain. As three-quarters of the atmospheric air consists of nitrogen, and as hydrogen forms one-ninth of all pure water, if some cheap means could be found for inducing the hydrogen of water to enter into combination with the nitrogen of the air in the form of ammonia, this valuable manure could be produced in unlimited quantities, and the agricultural products of the world enormously increased. The efforts to do this have been at last crowned with success, as will be seen by the following abstract of some recent continental researches.

Since the remarkable labours of Messrs Liebig, Schaltenmann, and Kuhlmann, on the fertilising action of ammoniacal salts, the production of ammonia at a low price has become a problem of the highest interest to agriculture. But to arrive at this result it is necessary to obtain the nitrogen elsewhere than in the nitrogenous matters; which may, for the most part, be employed directly as manures, and of which the limited quantities and elevated price permits in any event only restricted and costly manufacture.

Atmospheric air is an inexhaustible and gratuitous source of nitrogen. However, this element presents so great an indifference in its chemical reactions, that, notwithstanding the numerous attempts which have been made, chemists have not heretofore succeeded in combining it with hydrogen so as to produce ammonia artificially. This result, so long desired, has been reserved for MM. Margueritte and De Sourdeval, who have obtained it by employing an agent of which the remarkable properties and neat and precise reactions have permitted them to succeed where all others had failed. This agent is baryta, of which notice has recently been taken on account of the recent applications that M. Kuhlmann has made of it in painting, but of which no person suspected the part that it was to be called to play in the development of the agricultural riches of our country. The manufacture of ammonia is based on a fact entirely new, the cyanuration of barium. It had been believed until the present time that

potash and soda alone had the property of determining the formation of cyanogen; that the earthy alkaline bases—baryta, for example—could not, in any case, form cyanides.

Messrs. Margueritte and De Sourdeval have ascertained that this opinion is entirely erroneous, and that baryta, much better than potash or soda, fixes the nitrogen of the air or of animal matters in considerable proportions. It is already understood that, for the preparation of Prussian blue, the cyanide of barium presents great advantages over that of potassium, for the equivalent of baryta costs only about the one-seventh of that of potash. Thus do we find practically and really obtained the result first announced by Desfoes and vainly pursued in France and England—the manufacture of cyanides from the nitrogen of the atmospheric air. This solution, so important, depends on the essential difference which exists between the properties of baryta and those of potash; the first is infusible, fixed, porous, and becomes deeply cyanuretted without loss, the second is fusible, volatile, and becomes cyanuretted only at the surface, and suffers by volatilisation a loss which amounts to 50 per cent. After the cyanide of barium was obtained, the grand problem for Messrs. Margueritte and De Sourdeval to resolve was the transformation of the cyanide into ammonia by means at the same time simple, rapid, and inexpensive. The following is the operation:—

In an earthen retort is calcined, at an elevated and sustained temperature, a mixture of carbonate of baryta, iron filings in the proportion of about 30 per cent., the refuse of coal tar, and sawdust. This produces a reduction to the state of anhydrous baryta, of the greater part of the carbonate employed. Afterwards is slowly passed a current of air across the porous mass, the oxygen of which is converted into carbonic oxide by its passage over a column of incandescent charcoal, while its nitrogen, in presence of the charcoal and of the barium, transforms itself into cyanogen and produces considerable quantities of cyanide. In effect, the matter sheltered from the air and cooled, and washed with boiling water, gives with the salts of iron an abundant precipitate of Prussian blue.

The mixture thus calcined and cyanuretted is received into a cylinder of either cast or wrought iron, which serves both as an extinguisher and as an apparatus for the transformation of the cyanuret. Through this cylinder, at a temperature less than 300° (Centigrade) is passed a current of steam, which

disengages, under the form of ammonia, all the nitrogen contained in the cyanide of barium. It is impossible to foresee all the results of this great discovery. Among other things, it suggests the production of nitric acid from the air by oxidising ammonia.—Chemical News.

HOW TO MAKE THE BEST OF A BAD HARVEST.

That the past harvest has been one of the most precarious, protracted, and defectant ever known, is generally admitted; and it is also equally true that ever since the abolition of protective duties on corn, we have derived no advantage commensurate in a rise of prices; whereas in the palmy days of protection a bad harvest was sure to cause a considerable advance in the corn markets, and the farmers were thereby in some measure compensated for a defective yield and bad quality of grain. I am not disposed to think we are about to be inundated with foreign grain to an enormous extent. In fact, it is very doubtful if the present importations (and large they are) will be remunerative to the importers, and we don't hear of much being bought for our markets at present. Russia and the Baltic ports would, of course, pour all they could into our ports before the winter closed them in, hence the large supplies of this week. America has also a considerable quantity to send us. But France is likely to require a portion of their produce too, so that we need not feel unnecessary alarm at the present depression in the corn trade, but reserve all our best grain for better times, and make use of the inferior for feeding stuffs for cattle, sheep, and pigs.

How are we to make the best of a bad harvest?—This is an important question, and it is beyond my power satisfactorily to answer it. I will, however, endeavour to call the attention of my fellow-sufferers to the subject, as worthy of their deep and serious consideration. We have this ascertained fact before us, that whatever amount of grain or flour our importers can introduce for our sustenance, they fail to obtain a corresponding quantity of animal food. The graziers and feeders of our domestic animals have mainly the home market to themselves. Now, if our inferior and sprouted grain cannot be turned into flour, let us convert it into beef, mutton, pork, and poultry.

But how is this to be done? It is true that beans and peas generally constitute the cheapest and the best grain food for cattle and sheep, but this year the price of these kinds of grain is remunerative, and therefore we leave them out as cheap articles of food for this experiment. Oats, too, are realizing fair, if not good, prices for best samples, which, however, in this season are scarce. The only varieties of grain which being cheap are more applicable as food for stock, are those of wheat and barley; and this applies more particularly to the inferior qualities of each kind. The better qualities are yet obtaining fair and reasonable prices: these also must be left out, as too expensive.

At the present moment the relative prices of inferior

wheat and barley are very nearly assimilated, both realizing in the country markets about 1s. 1d. per stone. No one need, therefore, hesitate respecting the use of wheat as food for stock: it is quite as cheap as barley, and, upon the whole, more nutritious and fattening. The meal of barley may have the preference as food for pigs; but, in other respects, the meal of wheat in moderation is to be preferred for general service, provided it can be obtained at a price not exceeding that of the meal of barley. We have, then, this year an abundance of inferior wheat and stained and sprouted barley to dispose of as we best may. I again say let it be converted into meat; and I say this because "the seeds of cereals and leguminous plants are more nutritive than potatoes, carrots, beets, turnips, or any other roots," and because I believe it to be the most profitable manner in which we can bring it into the market.

The price of "butchers' meat" is unusually high, and the better qualities of meat not plentiful. The prospect of a continuation of remunerative prices is very good; nothing but commercial disquiet or derangement of our monetary affairs can prevent it. There is no valid reason to be urged against the appropriation of every kind of suitable food or of every available means for the fattening of stock. The country requires all that can possibly be fatted, and much more. The importation of store stock from abroad for the purpose of fattening them in this country is obtaining ground, and is rising into public favour. The importations of cattle for this purpose into Hull are very large, and they are found to pay the feeder well. They come in at a lower price than native breeds, and most of them under British management make excellent meat, and being of smaller size are much sought for by butchers for their quality and internal proof, *i. e.*, "dying well."

Agricultural chemists tell us that about 50lbs. of wheat are equal in nutritive value to 100lbs. of meadow hay, and that about 60lbs. of barley are of similar proportionate value; that it would take above 600lbs. of swedes or mangolds, or 350lbs. of carrots, or 300lbs. of potatoes to be of equal service in the fattening of stock. These are highly important considerations at any time; but in a season like this most especially so. Nor are the fattening qualities of the grain deteriorated by being sprouted to any extent. It will be in the recollection of many that, some few years ago, there was a general movement amongst the agricultural community for the purpose of inducing the Government to remit the duty upon all grain malted for food, and many were the experiments made and proofs deduced to show that the grain thus treated was more nutritious, the Govern-

ment of the time having also instituted an experiment in proof.

We have now plenty of grain in a semi-malted state, and in that state would no doubt make admirable food; but the best practice is to grind it into meal, and apply it as the best judgment may dictate. In either state it constitutes a wholesome and highly nutritious food for all stock. If the grain is too soft or too damp to grind kindly, it will be desirable to purchase some dry barley to mix with it. There is an abundance of dry foreign barley to be purchased in every market. It is thin and coarse skinned, but it will aid greatly in reducing the whole bulk into meal. I have no personal experience of the value of Indian corn (maize) as a mixture for inferior wheats and barleys for this purpose, but I imagine it would be found an admirable addition, and promote the satisfactory reduction of the whole into meal. The chief design of this mixture of dry and damp together for the purpose of grinding is to prevent the choking of the mill stones, and enable them to utter meal from soft grain which they could not otherwise do.

Much has been written respecting the value of steeped grain for stock. It is undoubtedly a very valuable article of food in this state, and in a season like this may be much resorted to; for in many instances it will be found that the grain will be too soft for profitable grinding, even when very sparingly mixed with hard grain. My impression is that in such a case resort should be had to steaming, as likely to make it the best food for general stock. Steaming soft or damp or tainted grain will sweeten it, and make it palatable for all kinds of stock; but steeping will, in many cases, make it more tainted, so much so that none but poor piggy, the general receiver, will partake of it. It is not

necessary that it undergoes a long process of steaming: a comparatively slight column of steam, thoroughly passed through a mass of grain, would soon deprive it of all taint, and also add something to its nutritive value. Another way to deprive grain of all taint is to pass clear water through it till it is removed: it may then be given to any kind of stock.

I said in my last paper, that wheat must not be given to general stock in its *grain* state without preparation by steam or steeping (wrongly printed *green* state), because it will swell in the stomach and become indigestible. Cattle and sheep would unquestionably thrive best upon it when given to them as meal, but it may advantageously be given in its prepared state, as above. Horses would thrive best by having the steeped or steamed grain given to them. Pigs would feed fastest upon it as meal, but in either way they will do exceedingly well upon it. As to the quantity to be given to each animal much will depend upon its state and condition. A fatting ox might have a stone a day, at two meals, morning and night. A horse might have a peck of steeped or steamed grain, but not more than eight or ten pounds of meal per day. A sheep might have a pint of grain or three-quarters of a pound of meal. A pig *ad libitum* or thereabouts, but not to waste it. Young stock of every kind would thrive well upon it, but they must be carefully supplied according to their age and condition. It is always good management to commence with moderate rations, and increase them as the stock progresses, which every judicious farmer will soon perceive: his judgment will then be his guide. In this way I trust that much benefit may be derived by every stock-master, and some compensation ensured for a truly bad harvest.

RIVER-DRAINAGE.

There is not an engineering question of the day more ripe for practical discussion than the trunk-drainage of our great valleys. The past season has borne ample testimony to this, for during the whole of the summer, as well as spring and autumn, our large rivers and their tributaries have kept low-lying districts literally in a bottom-sea of noxious water; thus subjecting the inhabitants, with their cattle, to consequences more easily imagined than described.

The topic of river-drainage is a national one, and in offering a few observations upon it we shall confine ourselves as much as possible to the leading principles involved in the work, in order to give within the limits at our disposal a passing view of its magnitude and importance.

It is the unretarded velocity of a river that indicates no less the purity than the quantity of water it discharges in a given time, and also that shows the health of the country drained. If it flows rapidly, it may be shallow, but the quantity of water removed will be large; while it will be clear—technically, “a crystal stream,” and the air pure and salubrious on both its

banks. If, however, it is a series of stagnant pools slowly emptying themselves into one another, the reverse of this will be experienced; for then, granting that there is an equal quantity of water—in other words, an equal area of land drained—the river will be deep, the water impure, the air of the country through which it passes pestilential, and the country itself badly drained; the climate and produce (animal and vegetable) being unfavourable to the health of its inhabitants. This is what all travellers find, who explore foreign countries; and it is just what we ourselves experience at home.

From these data it will readily be seen that in the practical consideration of river-drainage, velocity is the first problem that demands solution. Nothing short of this will serve the purpose effectually. Rushing over weirs and mill-dams, through canal-sluices, and under water-wheels, will not answer; for we all know the consequence when a stinking pool is stirred up, and this is just what water-wheels, sluices, and mill-dams accomplish—the liberation of gases generated in the semi-stagnant pools between them. From their source to

their confluence the channels of our rivers must have a uniform inclination, so far as possible, in order to obtain the desired velocity; thereby securing the quickest removal of the water with a minimum depth, together with the proper drainage of the adjacent lands on both sides. Were it possible to turn the water of the River Thames into the bed of the Tay, the Spey, or the Findhorn, where these rivers are crossed by the great trunk-railway of the North, we should then not only have a clear crystal stream, but one so shallow, that any Highland girl herding her father's cows could easily wade it without wetting her petticoats.

The facts of the case are thus as plain as the letters of the alphabet. It is the velocity, the rapid and continuous unretarded flow in our rivers, that can effectually drain the country of its superfluous water—that can preserve the atmosphere in its normal purity—that can secure health for the inhabitants of our low-lying districts, and that will permit the soil to be properly cultivated so as to yield sound health-giving produce for man and beast. On the contrary, it is the retardation and stagnation of water in our rivers by the ninety-and-nine obstructions exemplified in every valley, that floods the land—that produces pestilential gases, an unhealthy atmosphere, coarse herbage, disease in man and beast, and little profits on capital invested in what might be the best-paying land in the kingdom.

It is impossible, therefore, to parley the matter any longer with mill-dams, water-wheels, *et hoc genus omne*. Every obstruction of this kind must be removed from our river valleys. Not a vestige of mill-dams and water-wheels can be left behind, in the vast majority of cases, to tell where once they were.

No doubt some landowners and millers may feel a little reluctance to subscribe so sweeping a proposition. Many a set-off has been advanced in favour of "the mill" and "the mill-dam." They are old affairs, and sacred in the memory of the past. Their erection cost our forefathers much engineering skill and no little outlay of capital. To landowners they have long been a very special source of rent, while the miller continues to be one of the most respected guests at an audit dinner. All this and a great deal more must in justice be accepted in favour of things as they are and have been.

But granting the utmost that can be pleaded on this side of the question, systems grow old and give place to others, just as do landowners and millers, and the conversion of our rivers into canals and mill-dams must in like manner give place to railroads, steam power, and the general progress of things. Heavy rains and all superfluous water are now, through the instrumentality of a thorough system of drainage, removed from "uplands" in the shortest possible period of time, and thrown into our large valleys, and we must consequently proceed to drain them on similarly sound hydraulic principles.

Before following up the progressive steps of so important an inquiry, let us dispose of one of the offsets above referred to, that deserves a special notice, viz., "a main drain on each side of the mill-dam, with an outfall

immediately below the mill for the drainage of the adjacent grounds."

We have had occasion to examine professionally, as an engineer, many propositions of this kind, but never yet found a single case practically tenable. We have met with many cases where advantage was taken of the inclination of the river to start successfully a powerful water-wheel, but in such examples there was no damming back of the water, and hence no mill-dam in the river to retard the removal of those heavy floods that inundate our valleys. The conversion of a river or maintrunk drain into a standing lake, raising the water many feet above its normal level, is in itself diametrically opposed to drainage, to say nothing of the noxious decomposition of animal and vegetable matter in all stagnant water of this kind, and the pestilential malaria that is consequently continually given off from its surface, polluting the atmosphere.

To this side-drainage system there are other objections to those above, of which the following may be given as examples: A side drain seldom or ever intercepts the water that escapes from the dam so as to prevent it from rising by capillary action or otherwise somewhere in the adjoining lands. There may be examples of perfect interception and drainage, but we ourselves have never met with one. Again, in time of heavy floods, when side-drains are most required, they are worse than useless, owing to the state of their outfalls immediately below the mill. While in ninety-nine cases out of every hundred our rivers require to be deepened at those very outfalls, and this cannot be done at present, owing to the tailing back of the water of the mill-dam below.

The proper river-drainage of the country involves these and many other important engineering questions. Each example has its own peculiarities, present and future, as to details, whether we view it merely as a trunk-drain, or in a more extended sense as to expense, produce, and profit to landlords and tenants.

Examined from an engineering point of view, as a trunk drain only, it would not take a very large channel, if it could be cut in a straight line, to carry off all the water that now flows in any of our rivers. Towards its confluence with the sea, if a tidal river, considerable banking might be necessary, to prevent flooding at high tides; but in all cases of this kind, as it is the extremes for which provision has to be made, if the highest tide-lands are attended to, engineering difficulties disappear.

A straight river has many things in its favour. It is more easily made in the outset, and kept in repair afterwards, while it will carry off the most water, other conditions being equal, and occupy the least area of ground.

Where the valley on both sides of the river belongs to one landowner, and where there are many sharp bends, giving rise to eddies, and consequently to retardation of velocity, the landowner will have little difficulty in determining what course to pursue; and often, where the river winds about between two different estates, the two proprietors may profitably adopt the maxim of "take and give." By so doing, they will not only economise

land, but gain fall, and consequently velocity. Sometimes a river may be divided into two channels, one at each side of the valley, instead of only one in the middle. Owing to the continuous deposit of mud during floods, the land is generally highest contiguous to the river, and lowest at a considerable distance from it, the difference often exceeding several feet. Under such circumstances the channel of the river might remain open, in cases where it subdivides properties.

With regard to filling-up the old channels of rivers: it has often occurred to us, while employed on one occasion in straightening, deepening, and embanking a large river, that it would be more profitable to land-owners to leave them open and convert them into ponds for the rearing and fattening of fish, and into beds for the growth of willows and osiers for basket-makers, &c. We have here two branches of farming—both very popular at present—and we have every reason to believe that in many cases they are capable of being made very profitable sources of rent to land-owners, and investments for tenants' capital. As to appearances, the most unsightly kind of a river could easily be made an ornament to the county; but into details of this kind we cannot go at present. This view of the subject claims a careful consideration of land-owners and engineers, and we have said enough to draw their attention to it. The ugly nooks and bends of rivers now forming whirlpools, damming back the water, and flooding our valleys, can be easily set apart and profitably converted to the above purposes—each pond economically for its own kind of fish; and every spot not adapted for piscatorial farming could supply—some the demand of this basket-maker, others the wants of that, and so on, economizing land and increasing the productive resources of the country in two most important branches.

With regard to the miller: after the removal of the mill-dam and water-wheel, steam-power could in many cases be profitably applied to keep his mill-stones going so as to supply his customers; and where this cannot advantageously be done, one of two other alternatives may be adopted—either a new steam-mill in a more fitting locality, or sell the business. Under this head, we do not think that land-owners and millers ought to experience much difficulty in meeting each other's interests, so as both to be gainers, in the long run. At present, both are manifestly sustaining very heavy losses; and as it is equally evident that a general advantage would be gained by the contemplated change, why should not a reciprocity of interests be experienced?

As to present losses, many we have met with appear insensible of the deleterious nature of the climate and produce of some of our river valleys to the health of man and beast. The inhabitants of those low-lying, badly-drained districts, with their neighbours adjoining who live on their produce, enjoy a comparative degree of health, and therefore are unwilling to believe the place of their nativity so unhealthy as they really are, or the produce of the land inferior as to quality, especially dairy produce and butcher-meat, which they sometimes affirm to be superior—the best in the market. But in

this the inhabitants are very far astray in their conclusion. This evidently arises from their not attending to all the facts of the case experienced.

In all those wet, marshy districts inimical to animal health, Nature makes a wise provision by the growth of certain medicinal plants, which the cattle, when browsing on the coarse herbage, are instinctively led to eat. This not only keeps down disease from playing the sad havoc it would otherwise do among cattle, but it exercises a singularly beneficial influence upon the health of the people, who consume the milk of the cows fed on such plants, and also butcher'-meat from fat stock. It is long since Galen gave medical plants to cows in order to physic his patients with their milk—and this is just how the inhabitants of those districts are doctored and preserved in the health they enjoy, although they may be unconscious of it. The monks, when they first came to this country, were better acquainted with Galen's philosophy; for, on finding that they could not keep their health in our low, wet, and misty climate, they went to the marshes of Kent and Essex, and watched the cattle in order to ascertain the particular medicinal plants that they instinctively were led to eat, and doctored themselves accordingly. But medicated food of this kind not only loses its value beyond those districts, but is injurious in others—hence its objectionable character, and low value intrinsically in the market.

With regard to pecuniary advantages arising from a more perfect state of river drainage, there cannot be a doubt but the balance would be greatly in favour of both landowner and tenant. The project involves the investment of a large amount of capital not merely in drainage, but in the improvement and cultivation of the lands afterwards; so that, as in all other agricultural projects, the amount of profit will depend upon the judgment with which this capital is invested.

ENGINEER.

EFFECTS OF COLD.—The influence of cold upon animal life has been studied chiefly (as, for example, in reference to the phenomena of hybernation) at such degrees of temperature only as are insufficient to freeze the tissues. In cases of actual freezing, attention seems for the most part to have been directed to the organism as a whole, with a view of determining the question whether an animal apparently frozen to death could be revived. The olden writers often allude to the revival of frozen insects as a familiar fact. Rudolph states that frozen filaræ are brought to life upon thawing. Franklin found frozen fishes revive on thawing; yet John Hunter never succeeded in restoring the animals he had frozen. One element of uncertainty in such experiments (in those on vertebrate animals at least) is the difficulty of making sure that the heart itself is frozen, without interfering with the expected result. In the experiments of a later observer, Dussnéril, it seems clear that the hearts of the frogs he froze and recovered were not frozen, though the intestines were.—*Dr. Foster, in Transactions of the Royal Society, last Number.*

NEW EDIBLE ROOTS.

It is surprising how little we have experimentalized in this country upon new edible roots, which might come in as useful aids to the potato for food purposes. But two or three attempts are all that we can call to mind; and yet the field of research is a wide and a promising one, especially now that our trade with foreign countries, and quick steam navigation, places so many tuberous-rooted plants within our reach for trial and cultivation. The attempt to introduce some that might prove suitable to our climate, and enlarged by cultivation, is surely a patriotic one, and within the means of any enterprising cultivator who chooses to give himself to the task.

The introduction and success of the common potato is an example worth following. Two centuries and a half ago this root was recommended by old Gerarde, in his "Herbal," to be eaten as a "delicate dish," but not as a common food; and within little more than a century its culture has been so extended over the United Kingdom, Europe, and America, that it has not only become a *common* food, but the various uses to which it is applied are almost infinite. And yet, if we trace it to Chili and Peru, we shall find that in its indigenous condition it bears but a poor resemblance to the magnificent tubers resulting from continued careful cultivation.

Protracted nursing has alone produced such effects on wild vegetable productions as to render them our commonly cultivated plants. The large and juicy Attringham carrot is only the woody spinal root of the wild carrot, luxuriously fed. Our cabbages, cauliflowers, kohlrabis, and turnips in all their varieties, spring from one or more species of *Brassica*, which in their natural state have poor woody bitter stems and leaves, and useless spindle-shaped roots. Our cultivated potato, with all its varieties, springs from the tiny and bitter root of the wild potato, which has its native home on the sea-shores of Chile; and our apples, plums, grapes, strawberries, and other prized fruits, from well-known wild and little-esteemed progenitors. Our gardens are full of such vegetable transformations. It is so also with our corn plants.

It is the new chemical conditions in which the plants are placed which cause the more abundant introduction of certain forms of food into this circulation; and the more full development, in consequence, either of the whole plant or of some of its more useful parts. It has been well observed that if a new plant has a chance of becoming useful in rural economy, it must fulfil certain conditions, in the absence of which its cultivation cannot be profitable. In the first place it must have been domesticated in some measure, and must suit the climate; moreover, it must in a few months go through all the stages of development, so as not to interfere with the ordinary and regular course of cropping; and, finally, its produce must have a

market-value in one form or another. If the plant is intended for the good of man, it is also indispensable that it shall not offend the tastes or the culinary habits of the persons among whom it is introduced. To this may be added, that almost all the old perennial plants of the kitchen garden have been abandoned in favour of annuals wherever the latter could be found with similar properties. Thus *Lathyrus tuberosus*, *Ledum telephium*, &c., have given way before potatoes, spinach, and the like.

Let us glance at some of the roots and tubers eaten in different countries which are worth notice. We need not specify the sweet potato, the cassava or mandioc root, the yam, and other tropical tubers which can scarcely be acclimatized here; although some may be so modified, as we have seen in the Chinese yam, as to be raised with care here. It is a curious investigation to run over the different roots that are eaten as food by many tribes and people, many of which would not be very acceptable to the dainty palates of Englishmen. Very few of the coarse fibrous yams would find favour with those used to the mealy potato.

The root of the common caraway plant when improved by culture resembles the parsnip, and is used as food by the inhabitants of the North of Europe.

Many of the water-plantain tribe have a fleshy rooting stem which is eatable. At the root-stock of the arrowhead (*Sagittaria sagittifolia*) there is a tuber composed almost entirely of starch. The fecula of these tubercles Martius compares to arrowroot. The Calmucks, the Chinese, and the Japanese eat these as articles of wholesome food. By the two latter the plant is cultivated for these tubercles. From the bulbous roots of the cacomite, (a species of *Tigridia*), a good flour is prepared in Mexico.

The roots of several species of *Caladium* are nutritious, and furnish an abundance of food. The very large roots of the *C. esculentum* especially furnish a great quantity of fecula. Several species of arrow, the same family which furnishes the indigenous Portland arrowroot, formerly held in some repute, are eaten in different countries. *A. indicum* is much cultivated in Brazil, about the huts of the natives, for its esculent stem and pendulous tuber. The roots of *Arisarum vulgare* are boiled and eaten in the South of Europe. *Amorphophallus campanulatus* is extensively cultivated in the northern Circars, India, for its roots, which are highly nutritious. The roots of *Colocasia microrrhiza*, a native of the Moluccas and the South Sea Islands, are very large, and when washed to deprive them of their acid principle, are eaten in Tahiti. *Colocasia esculenta* grows in Spain, Portugal, Sardinia, and particularly in Egypt, where it has been cultivated from time immemorial for its roots, which serve as an article of food. They contain an immense quantity of fecula,

and are eaten by the inhabitants of Egypt and some parts of India as potatoes, forming the principal food of the inhabitants; their flavour is like that of potatoes. The roots of *C. himalensis* form the principal part of the food of the hill people of the Himalayas. The very large roots of *Caladium arborescens*, a Brazilian shrub, yield a great quantity of starch. The bay-root, which grows about the out-islands of the Bahamas group, was found of great use as a food-plant to the inhabitants of Long Island during a scarcity of food occasioned by the drought of 1843. The root grows in the form of a large beet, and is from twelve to sixteen inches in length. It is entirely farinaceous, and when properly ground and prepared makes good bread. The bulbous roots of *Ornithogalum umbellatum* have been commonly eaten in Italy, in Syria, and the neighbouring countries. Dioscorides says that it was sometimes dried, pulverized, and mixed with corn-flour; and that it was also eaten both raw and washed. Lamerteus, in his "Essay on Bulbous and Tuberous Roots," states that in his time the peasants of Italy and the neighbouring countries often roasted the roots of the *Ornithogalum*, and eat them like chesnuts, or lightly boiled them, and peeled and used them as salad, with oil, vinegar, and pepper.

The French have been much more zealous than we have in this inquiry for new edible roots. Among others brought under the notice of the Academy of Sciences have been the bulbous-rooted cicely (*Cherophyllum bulbosum*), a European plant of the most easy culture, which will grow in any soil. It yields an abundance of tubers about an ounce each, very wholesome, containing 21 per cent. of starch. The turnip-formed tubers, when taken up early in the spring, are eaten in France and Germany, boiled with oil and vinegar. The roots only contain 63 per cent. of water, while the potato consists of 74 per cent. and more. We are not told, however, whether the root can be presented at table in its native form, like the potato, or without any other cooking than simple boiling.

Another plant brought under notice of the Academy was introduced from New Granada, under its native name of Shicarra only, which has white, juicy, and sweet tubers, that can be eaten raw. It is an annual shrub, growing to the height of about three feet, and as it stands cold well, it was thought it might prove a rival to the beet-root in Europe, being richer in sugar.

The roots of *Apios tuberosa* are eatable, and are sold in some of the German markets. Professor Eaton, in his "Manual of Botany for North America," remarks that this nutritive root ought to be generally cultivated. The tubers are, however, not larger than cherries, but very farinaceous, with a large per centage of starch. The roots of *Claytonia tuberosa* are eaten in Eastern Siberia; and an American species, *C. acutiflora*, has been recommended for experimental culture. The tuberous roots of *Bunium bulbocastanum* in Europe, like those of our British species *B. denudatum*, contain well-known nutritious qualities. When boiled they are very sweet and delicious. In Holland, the Alps, and in some parts of England, they are used in

soup, and also roasted under the embers, when they eat like roasted chesnuts. The tubers of *B. ferulaceum* are used the same way as gum. The *Apios* (*Arracacha esculenta*), a perennial, is extensively cultivated for culinary purposes in the temperate mountain regions about Santa Fe de Bogota. The large roots are cooked and eaten in the same way as parsnips, but considered better and easier of digestion. It has been introduced into the South of Europe. A very promising tuber seemed to be the *Ocas* of South America, various species of *Oxalis*, but they have not been persevered in long enough to ascertain whether the roots might not be enlarged by continued culture. *O. crenata* was introduced a few years ago from Peru, as an object of cultivation in this country for its tubers. These, however, are rarely more than two ounces in weight, and although they are of a mealy consistency, and by some considered if not equal, at least a good substitute for the potato, it has not been found profitable to devote any attention to their culture as an esculent, since the average produce of a plant did not exceed half a pound, hence the experiment was dropped. *O. tuberosa* is extensively cultivated in Bolivia for its numerous tubers, which are like small potatoes, and about an inch in diameter. They have a slightly acid flavour, which is disagreeable to most persons; this is lost by exposing them to the sun, the acidity being thus converted into saccharine matter, and the tubers become as floury as the best varieties of potatoes. The tubers are exposed in Bolivia for ten days in woollen bags, which appear to facilitate the conversion of the acid. If the action of the sun is continued for several months, the *Ocas* becomes of the sweetness and consistency of dried figs; they are then called Carri.

Bryant describes a root, which he met with on the great prairies of California, and which he called the prairie potato. He considers it in many respects superior to the common potato, and that it might be useful to introduce into cultivation. As no scientific description of the plant is given, it is difficult to determine what it is, for prairie turnip and prairie potato are terms for a very large number of esculent roots in North America, and include some species of *Psoralea*. A little town called Stowe, in Vermont, uses some 20,000 bushels of a peculiar kind of coarse potato called the California potato, which yields eight pounds of starch to the bushel. Whether there is any relationship between these potatoes we cannot state. At least this subject of new esculent tubers is well worth looking into and testing practically, systematically, and perseveringly.

BATH AND WEST OF ENGLAND SOCIETY.—The monthly meeting of the council of this society was held at Waghorn's Railway Hotel, Taunton, in the last week of November, J. W. Buller, Esq., M.P., president of the society, in the chair, and the following members were also present: The Earl of Devon, and Messrs. E. S. Drews, J. Widdicombe, J. Hussey, J. T. Davy, T. Newman, R. May, W. Wipple, R. N. Grenville, Jonathan Gray, G. Poole, J. H. Cotterell, C. Bush, J. Bailward, E. Vidal, D. Adair, S. Pitman, H. G.

Moysey, M. Farrant, T. Danger, J. Fry, R. G. Badcock, T. D. Acland, W. E. Gillett, and H. St. John Maule (secretary). The report from the Implement Committee was read and approved. The week for the Truro meeting was fixed for that commencing on Monday, the 3rd of June. J. E. Knollys, Esq., was appointed steward-elect of implements in the field for the years 1861-62. It was stated that application had been made to the South Western Railway Company to grant free passes to the members of the council attending these meetings exclusively, in the same way as was done by the Bristol and Exeter and North Devon Railway Companies, but the request had been refused. Mr. J. Widdicombe brought up the report of the Stock Prize Sheet Committee, by which the prizes were increased £200 over those of last year. The report was agreed to. The Mess Committee reported that they were proceeding with their arrangements, but had not quite completed them, and were requested to continue their labours. The Steward of Poultry moved for a grant of £150 for prizes in that department at the Truro meeting, which was acceded to. Mr. S. Pitman moved, "That the place of meeting for 1863, 1864, and so on in future years be considered at the August meeting of the council, and the place finally selected, if possible,

at the meeting of the Council in October following." It appeared that the council had always practically acted upon the motion, and it was therefore made a standing order without opposition. The council then went into the consideration of the question of selecting a place for the meeting of 1862. Several letters were read, but, after some discussion, the council resolved that they were not then in a position to come to a decision, and the subject was therefore postponed to the next meeting, January. Mr. J. H. Cotterell called the attention of the council to the necessity of preserving the books and other property of the society, and committee was appointed and requested to bring up a report at the next meeting, stating whether it would, in their opinion, be advisable to dispose of any and what portion of them. It was suggested that in and after March next the meeting of the council should be held on the first Saturday in the month, instead of the last: the matter was referred to the January meeting. The secretary received instructions to advertise the Truro meeting in the newspapers. The President was requested to write to the Committee of Council on Education for a loan of a selection of their specimens, for the exhibition at the Truro Meeting as heretofore. The council then adjourned.

THE BIRMINGHAM AND MIDLAND COUNTIES CATTLE AND POULTRY SHOW.

The unfavourable season and "the hard times" for farmers already begin to show their effects. Despite even the still increasing energy of the management, backed by the more than usually liberal offers of the prize-sheet, the Birmingham Fat Cattle Show is unmistakably below the average of its previous excellence. In the three great classes of Shorthorns, Herefords, and Devons, this was at once apparent. With the exception only of the Duke of Beaufort's steer, there was nothing approaching the character of a Gold Medal beast in Bingley Hall. We left last year with the impression, as we said at the time, that one meeting would be more or less the echo of the other, and that the great winners of the Midlands would be equally distinguished in the Metropolis. This proved to be the case; while in the present instance we cannot think that either of the Gold Medal animals of the week past will be the object any such similar attraction in the present. Both in numbers as well as in merit there was a falling off. There were fewer Herefords and Devons—very few in fact; while the Shorthorns, counting up to about as many as last season, had nothing like the same quality to recommend them. There was no such star as Beauty's Butterfly, to begin with; and though the judges did generally commend the class of oxen, the compliment did not strike one as being altogether deserved. Nevertheless there were some "famous" animals in the entry. Mr. Stratton sent "Bee," one of the best of his herd, as manifested at the Cardiff Meeting a year or two since; and Mr. Wells from Kent pitted against the Hinton heifer his "Tweedside Lass," a commended cow at Canterbury. Then the Duke of Devonshire had "Sarah Gwynne;" Mr. Sanday, a contemporary

of some renown; and Captain Gunter, "Princess Royal," the prize fat cow at the Yorkshire Meeting in August. Still, none of them told much here. The Duke's and the Holme Pierrepoint cows have now in fact, each at over eleven years old, grown out of all shape, and standing as they did on either side of her, furnished in the way of a comparison a capital set-off for Colonel Pennant's level, broad cow, a very good one from the view either fore or aft, but failing a little behind the shoulder. Lord Howe backed her with another very neat one; but despite the Gold Medal staying with the cows, the interest of the occasion clearly centred on the heifer class, a company of four, which included "Princess Royal," the "Bee," and "Tweedside Lass." The point, however, was entirely between the two latter, and so knotty a one was it, that the duly appointed authorities were unable to give a preference, and their fellow-labourers from among the pigs and sheep had to be called in. With their aid the award was eventually declared for Mr. Stratton, and no wonder; for Bee must have at once taken the fancy of the two West countrymen; being as neat and as round as a Devon in form, and of just the fine red tint in colour. But our own affections went certainly with the minority. Mr. Wells' heifer has a deal more style and quality, with a handsomer appearance, finer hair, and altogether a better handler. Indeed, if she had only been properly prepared, or in other words, thoroughly fattened, we might have stood on her for the medal. Since Brackley, however, she has been thrown back, with the intention of breeding from her, and is supposed now to be in calf. We shall not stay to dwell here again on the mischievous absurdity of such a system as

this, further than that the two will not meet again in Baker-street, as "Tweedside Lass" returns at once to Penshurst—with the recommendation, just at present, of not being exactly either a fat or breeding animal! Curiously enough, at thirteen days old, when coming from the Bushey sale, this heifer broke her hind leg; but it was so well set, and so carefully tended, that without being told, it would be impossible to say whether it were the "near" or "off."

Mr. Richard Stratton has only the credit of breeding the first prize ox, for which we imagine he receives the customary silver medal, though the official prize list is strangely silent as to the fact. This is a big, heavy, up-standing beast, but by no means a handsome one; indeed, there was nothing particularly good-looking amongst them. Mr. Manning's second is also a "big-un;" but there was another or so, over which we could scarcely interpret the general commendation. However, the pride of the Shorthorn "oxen or steers" rested altogether on the Badminton beast, a wonderfully developed and truly-grown animal for his age—only two years and nine months. The very first glance at him, as you catch the deep red and white patches on his coat, tells of Bates' blood, only the further to be confirmed by the way in which he handles. Then he has the same character expressed in his handsome head, while he stands very grand before, and is wide, deep, and even "all over." But his black nose is sure to go against him, and much as the Judges admired this steer, we scarcely fancy another court will be found to put quite so high an estimate on him. Both Mr. Langston's second and Mr. Stratton's third in this class were whites—the former of the two a superior beast in many points, but nipped in behind from an injury when a calf. The Sarsden herd also sent a sweet shorthorn cow, which took the prize in the extra stock, having unfortunately never bred, notwithstanding her having undergone "the Bowley operation."

As a lot the one class of Hereford cows was the best of the show. There was Mr. Pitt's deep broad one, and Mr. Tudge's neater and prettier, that the Ludlow and Hereford meetings had severally preferred, while there was now another very handsome one of Mr. Hill's to separate them. For use perhaps the Ludlow and Birmingham decree was the more proper one, but still the first prize has not the style of either of the other two, and another set of judges would be very likely to take another new reading over these three Graces. Mr. Cother was also deservedly commended for a fine roomy cow, lighter in colour and larger in frame than is just at present the fashion. The only Hereford heifer of note was the Messrs. Mappowder's, and she is so grand and good, and altogether so full of promise, that one regrets to see her thus early on the condemned list. Mr. Shirley again had the best steer, with another full-fleshed, compact, curly-coated one, but of nothing like the stamp of his famous ox of last year; and a long way the handsomest ox was Lord Aylesford's, bred by Mr. Tudge; he has fed very level, has a capital touch, and really quite a model head, with a beautifully turned horn. The second prize has been a great deal fancied this au-

turn by the Ludlow people, in which district he was bred. He has great size, but otherwise did not come up to the promises made in his name. Such good men as Lord Batemen, Mr. Naylor, and Mr. Aldworth, came in, it will be seen, for their commendations; but either for numbers or excellence the Hereford oxen or steers were not to be compared with the entries of former years.

There were in all eleven Devons—two oxen, one of which received the first prize and the other the second; one cow, with the first prize all to herself; four steers, and four heifers. His Royal Highness the Prince Consort was first in both the younger divisions with a couple of Zouaves, and the heifer Lovelia, the pick of the breed—our first favourite of many a meeting, but now, alas! on her way to the block. She looks as handsome as ever, but her beauties now are only to be reckoned in stones and pounds. Mr. Farquharson's steer was quite a thorough-bred one in appearance, with a clean fine head, a bright eye, and a horn that rambled and twisted after the most picturesque of patterns. Mr. Farthing's cow has had seven calves in ten years—a far more liberal allowance than some of the very "pure" can own to; and Mr. Overman exhibited ample proof from his own herd that the Devons do none the worse for transplanting. Mr. Faulkner, of Bretby, showed the best Longhorn that has been out for years, as we said of her when we first saw her a few months back at beery Burton; but she was only indifferently supported here, and numbers did not go to make up for merit. There is an "indecision" about the present character of the Longhorn, which says how surely he is going out. There was but one Welsh steer in his own proper class, and he would stand no comparison with the one referred to hereafter; while the eight Highlanders were quite out-weighted by Mr. M'Combie's grand Galloways; but two or three young things amongst the Highlanders were more starved than fed, and could so have no rank in a Fat Cattle Show. The "other breeds" were made up of a curious composition of crosses or no crosses. The first prize, for instance, was a mouse-coloured, narrow-loined steer, described as a "cross-bred Shorthorn," that is apparently a common-bred beast of the genus Durham. We certainly preferred one or two in the class to him, more especially his second, Colonel Pennant's finely-grown, evenly-fed Welsh ox, which took the prize last Christmas here in his class as Mr. Doig's, but has since been transferred to the Colonel. The commended cross, again, that famous nick between the Shorthorn and Aberdeen, was a capital illustration of what may be done in such a way; while Mr. Beasley tried the Highlander with the Durham; Mr. Gibbs, the Longhorn and Shorthorn, and so on. But, as we said in our report last year, "in this place, for a wonder, the catalogue is weak. Of course the whole value of a cross rests upon the way in which it is achieved, and the entry of such description of stock cannot be considered perfect without these particulars. As to seeking information from a herdsman, he frequently either does not or will not know. We were calmly assured that one beast entered as 'a cross'

was got by a Shorthorn bull out of a Shorthorn cow ! And the man, though previously civil enough, was rather indignant when we ventured to doubt so legitimate a means for obtaining half-bred produce." As we have already intimated, the same sort of loose entry was admitted this year again, and the Birmingham management may look with advantage to what is about to be done at the Smithfield Club. At the meeting of the members to-morrow Mr. Thurnall will move "that all exhibitors of cross-bred animals shall be required to specify the exact nature of the cross—that is, the breed of sire and dam respectively, and whether the animal exhibited is the result of a first or more remote cross."

The sections where the Birmingham show of this season did not decline, but the rather if anything advanced, were the sheep, the pigs, and the roots. The shortwools were perhaps never previously so good, and the Duke of Beaufort, Lord Radnor, Lord Walsingham, Sir George Throckmorton, and Mr. Overman would seem all to have improved upon their sample of the Southdown, the Duke and Lord Walsingham particularly. The judges, in fact, commended every pen of Southdown sheep exhibited; the only reason why the younger class was not so generally commended was from the fact of there being a Hampshire Down in it which they could not include in any such order of merit. The names of one or two new men here went to still further assert the superiority of the Yorkshire, or more properly the Driffield Leicesters, which Mr. Jordan does so much with in London. There were one or two lots of better-looking Cotswolds than usually travel thus far; while the trump-card of all the sheep was of course again the Shropshire. The class, indeed, was thought to be too good for the Judges, amongst whom there was not one breeder of the Shropshire, and common opinion did not go altogether with the awards. The first prize for the younger wethers they gave to some handsome sheep of Mr. Holland's, and the second to a useful lot of Mr. Mansell's; and had they stopped here all might have been well enough. But they went out of their way to commend two pens of Lord Aylesford's, really as it would seem for no other reason than that they were Lord Aylesford's. Sheep with plain, coarse heads, very middling frames, and "frills" and fronts of dark wool and "scuts" as black as night—the most unsaleable of so saleable a commodity. Then, both the first and second prizes for the older wethers went to Lord Dartmouth for some true and straight useful farmers' sheep, while they utterly ignored Mr. Orme Foster's magnificent lots, one of which certainly included the best Shropshire in the show. If Lord Aylesford's were worth commending at all, Mr. Foster's, Mr. Smith's, and Mr. Holland's other pen were far more so. For the future it will be better to have at least one Shropshire man as a Judge of Shropshires, and there are many who do not exhibit. This breed it must be remembered are the first both in point of excellence and numbers of all the sheep shown in Bingley Hall, and two Devonians and a gentleman from Berkshire were called in to pronounce upon them !

The same trio tried their hands, with more success,

on the swine, all three, if we place them aright, having some position as pig-men.

There was ample opportunity for the exercise of their abilities in this way, and the chief difficulty must have been in discriminating between the several merits of blacks and whites. The confusion of colours was terrible. Mr. Crisp, for instance, showed "improved Suffolks" *black*, and "improved Suffolks" *white*, in the same class, but as different in their breeds as in their hues. The judges themselves were known to have a leaning to the darker shades; but so far as we could follow them, they appear to have acted very impartially, although Mr. Wiley did, we believe, for the first time in his life, rank no higher than second in Bingley Hall. However, the chief prizes in both the "pen" lots of fat pigs went to the whites. Mr. Morland's are very handsome to look upon, but they are rather coarse in quality and harsh in the hair; while Lady Chesterfield's very pretty specimens are doing more and more to establish the Bretby breed. For second place here the Butley Abbey blacks were preferred to the Canterbury prize whites from the same homestead, while in the single fat pig class Mr. Mangles' "Royal" sow could only get second to another of the Chilton entries, and Mr. Harrison and Mr. Sexton, both first prizes at Canterbury, had to be content with simple commendations. But it took not merely the three pig judges proper, but four others were called in before it became quite safe to say that Mr. Morland's boar was really better than Mr. Mangles' sow. The Tamworth pig no longer gives a speciality to the Birmingham Show, as he has been found not to tell much upon parade. We rather regret this, as he has many useful points, particularly for a cross; and it did strike us that some "improved Leicesters" here owed their increased size and length to such a source. The "rosy" tinge in their coats went all to confirm the supposition. The Berkshires, in Bingley Hall, have become so good a class that, following the example of the Shropshire sheep-breeders, their supporters are about to ask of the Council that these pigs may have a similar section all of their own, at the meetings of the Royal Agricultural Society. Certainly the show of last week went far to warrant a gracious answer to "the prayer of your petitioners." Never has there been so strong a one, and a known man like Mr. Hewer could get no actual rank in such good company; notwithstanding that the judges doubled their allowance of premiums. Sir Francis Holyoake Goodricke's pigs are so perfect—with such short fine heads, lengthy backs, and true shoulders—that it will be a difficult task even for the home-breeders of Berks and Wilts ever again to excel them. There were more than twenty lots of five each, with scarcely an indifferent pig amongst them, if we only except the last pen in the entry. Mr. Fowler, of Aylesbury, is clearly not that authority over a pig that he is with a duck or a goose, and long snouts and razor backs are woefully below his "form" in other ways. In the little pigs, as we have already mentioned, the very handsome Bransburys were only second, Mr. Stearn's white Suffolks commended, and Mr. Watson's Cumberlands not even no-

ticed. They had all to succumb to some black Suffolks of especially fine quality; Mr. Crisp's most direct opponent, as exhibiting the same sort of pig, being disqualified as above "the six months" old. These offenders were placed on the catalogue without any age whatever attached to the nomination. The show of pigs is always excellent here, but it perhaps never was so generally good, and we should like to have seen a few more of those encouraging Medals which at one time the Council were wont to distribute so liberally.

Bad a time as it may have been for stock, according to the argument here maintained, most assuredly it could not have been so for the growth of roots. In fact, never before was there such a collection of long mangolds, and globes, and swedes, and carrots and cabbage. Mr. Smith of Woolston of course traces his success to steam cultivation, but practical people shook their heads over some other of the fine specimens when they came to remember the season of the year in which they had been "reared." No doubt a prize, root like a prize beast, will take a deal of feeding and tending; but it is something after such a year to show mangolds and swedes like Sir William Heathcote's, kohl-rabi like Mr. Smith's, carrots equal to the Duke of Portland's, or "a mouthful" of ox-cabbage to compare with that of Mr. Robinson. We never remember seeing so many empty poultry pens, but the merits of the birds were in an inverse ratio, and people begin to know better than to send merely for the questionable *éclat* of being beaten. The judges appended long strings of high commendations to many of the premiums they had to award, and the *Midland Counties Herald*, of which the poultry show has been from the first a pet child, declares: "The improvement is very remarkable in the game classes; the single cocks in the class for brown and other reds, except black-breasted, comprising several admirable specimens of this popular breed. The same remark will apply to the other classes for game fowl, both old and young, which are exhibited in very fine condition; the only exception being the white and piles, and the black and brassy-winged. The Dorkings comprise some of the most marvellous specimens ever brought together. None of these birds were weighed here, but a second prize pen of two hens weighed 19lbs. The silver grey Dorking cocks are imperfect in the plumage, which will doubtless be rectified another year. It is decided that they should have no white feathers in their tails, and no brown feathers in their wings. The coloured Dorkings, old birds, are a very excellent class, as will be apparent from the fact that Captain Hornby has this year to be content with a fourth place. The chickens are quite equal to their seniors, and comprise as fine a collection as were ever assembled within the walls of Bingley Hall. The white Dorkings are also in most excellent condition—far superior to any hitherto exhibited. The Spanish fowls are inferior to those we have seen in former years, the general condition of all the birds being indifferent. This degeneracy may generally be attributed to the unfavourable season. The chicken classes of this variety

are also very backward in condition. The Cochins, both coloured and white, are an admirable collection, the plumage of the cock in the prize pen of the partridge-feathered being equal, if not superior, to anything we have ever witnessed. The Bramah Pootras appear in excellent feather; and the peculiar characteristics of the breed are well exhibited. The Polish, which for the last few years have been degenerating, appear likely to resume their former *status*, the present collection being in as excellent condition, and of as good a quality, as they were in their most palmy days. The Hamburgs, which are chiefly admired for the beauty of their plumage, are in exquisite feather and condition. The Malays are also exceedingly good. In the single cock classes, the Dorkings muster in great force, and in splendid condition—so much so, that many birds which a few years ago would have carried off first prizes, have now to be content with a simple commendation. The Spanish suffer, in conjunction with the other classes of this variety, from inferiority of condition; while Cochins, Chinas, Polish, and Bramah Pootra are fairly represented. The Hamburg cocks, with the exception of the Golden Spangled, are as good as could be wished. The most striking improvement is exhibited in the Turkeys, Geese, and Ducks, in proof of which we may mention that the prize pen of Turkeys, the property of Mrs. Fowler, of Prebendal Farm, Aylesbury, consisting of a cock and two hens, weigh no less than 61lbs., the second prize pen 55lbs., and the third 54lbs.; highly commended pens also weighing 47lbs. and 48lbs. each. The young birds are equally good, the first prize pen weighing 47lbs., and the second and third respectively 43lbs., three other pens being within a quarter of a pound of the latter weight. Ducks are equally excellent, the first prize pen weighing 31lbs., other pens 27lbs. and 28lbs. The improvement in the weight of Geese is still more remarkable, the gander and two geese in the first prize pen weighing 60lbs., while the first class pen in the grey and mottled class exceed 71lbs.; the second and third prize pens weighing respectively 66lbs. and 56lbs. In the extra class for Ducks of any other variety there are several novelties, the most striking being a pen of White-eyed Bahama Ducks, exhibited by Lady Lillian M. Paulet, and to which the first prize is awarded. These birds are very great curiosities, and the present are the first that have ever been exhibited at Bingley Hall."

Once out of the Hall, and our next turn is for the Repository, where the Dog Show has already outgrown its house-room. As we said last year, "there was no reason why it should not work on; but it should be nearer to Bingley Hall, or why not in the Hall itself?" This suggestion is to be acted upon, as it would be utterly absurd to again brave such a crush as that of Tuesday last. With the exception of the otter hound, almost every known breed of dogs was to be found here; but some of the classes, such as the foxhounds, greyhounds, terriers, and sheep-dogs, were not very strong, while the large pointer dogs, the small pointer bitches, and the Irish setter dogs were especially good, the entry of pointers alone exceeding a

hundred. The bloodhounds, clumbers, and retrievers, also embraced many noble animals amongst them; and there were some absurd curiosities in the way of toy terriers, Italian greyhounds, pugs, bulls, and pets. But the point to fight at for the future will be dogs for the gun and the Hall—pointers, setters, spaniels, retrievers, and so on. A Hound Show in December will never tell.

PRIZE LIST.

CATTLE.

JUDGES.—Mr. G. Bright, Broom, Aston-on-Clun, Salop.
Mr. R. Budding, Panton House, Wragby, Lincolnshire.
Mr. P. Halse, Molland, South Molton, Devon.

HEREFORDS

OXEN OR STEERS.

First prize, £10, and extra prize of £20, as "best Hereford," the Earl of Aylesford, Packington Hall, Coventry.
Second, £5, Mr. J. Towers, Ludlow.
Highly commended, Mr. J. Naylor, Leighton Hall, Welshpool, Montgomeryshire.

STEERS.

First prize, £10, and silver medal as breeder, Mr. R. Shirley, Bawcott Tugford, Munslow, Shrewsbury.
Second, £5, Mr. J. Towers.
Highly commended, Lord Bateman, Shobdon Court, Herefordshire; Mr. T. Taylor, Burleigh Villa, Wellington.
Commended, Lord Bateman; Mr. W. Aldworth, Frilford, Abingdon.

Cows.

First prize, £10, and silver medal as breeder, Mr. G. Pitt, Chadnor Court, Dilwyn, Leominster.
Second, £5, Mr. R. Hill, Golding Hall, Shrewsbury.
Highly commended, Mr. W. Tudge, Ashford, Ludlow.
Commended, Mr. W. Coher, Middle Aston, Oxford.

HEIFERS.

First prize, £10, Messrs. J. W. and C. J. Mappowder, Blandford, Dorset.
Second, £5, Mr. J. Williams, St. Mary's, Kingsland, Leominster.

SHORTHORNS.

OXEN OR STEERS.

First prize, £10, Mr. J. Stratton, Manningford Bruce, Pewsey.
Second, £5, Mr. J. Manning, Milton Ham Farm, Northampton.

The class generally commended.

STEERS.

First prize of £10, extra prize of £20, as "best Shorthorn," and GOLD MEDAL as "best ox or steer in the yard," the Duke of Beaufort, Badminton, Chippenham.
Second, £5, Mr. J. H. Langston, M.P., Sarsden House, Chipping Norton.

Highly commended, Mr. R. Stratton, Broad Hinton, Swindon.

Cows.

First prize, £10, Vice-President's prize of £21 as "best cow or heifer bred by the exhibitor," GOLD MEDAL as "best cow or heifer in the yard," and silver medal as breeder, Col. Pennant, M.P., Penrhyn Castle, Bangor.
Second, £5, Earl Howe, Gopsall Hall, Atherstone.
Commended, the Earl of Radnor, Coleshill, Highworth; Mr. T. Hands, Canley, Coventry.

HEIFERS.

First prize, £10, and silver medal as breeder, Mr. R. Stratton, Broad Hinton.
Second, £5, Mr. W. Wells, Redleaf, Penshurst, Kent.
Highly commended, Captain Gunter, The Grange, Wetherby.

DEVONS.

OXEN OR STEERS.

First prize, £10, President's prize of £25 as "best ox or steer bred by the exhibitor," extra prize, £20, as "the best Devon," and silver medal as breeder, Mr. J. J. Farquharson, Langton House, Blandford.

Second, £5, Mr. J. Overman, Burnham Sutton, Burnham Market, Norfolk.

STEERS.

First prize, £10, and silver medal as breeder, his Royal Highness the Prince Consort, Windsor Castle.
Second, £5, Earl Howe.
Commended, Mr. J. Overman.

Cows.

First prize, £10, Mr. Walter Farthing, Stowey Court, Bridgewater.

HEIFERS.

First prize, £10, and silver medal as breeder, his Royal Highness the Prince Consort.
Second, £5, Mr. J. J. Farquharson.
Highly commended, Mr. W. Farthing.
Commended, Mr. A. Umbers, Weston Hall, Leamington.

LONGHORNS.

OXEN OR STEERS.

Prize, £5, Mr. J. Reading, Priors Hardwick, Southam.

Cows OR HEIFERS.

First prize, £10, Mr. J. Faulkner, Bretby Farm, Derbyshire.
Second, £5, Mr. T. Satchwell, Hernfield House, Knowle, Warwickshire.

OTHER PURE BREEDS, AND CROSS-BRED ANIMALS.

OXEN OR STEERS.

First prize, £10, and silver medal as breeder, Mr. A. Pike, Mitton, near Tewkesbury (cross-bred shorthorn).
Second, £5, Colonel Pennant, M.P. (Welsh).
Commended, Mr. David Ainslie, Costerton, Blackshields, Midlothian (polled Aberdeen and shorthorn).

Cows.

First prize, £10, and silver medal as breeder, Lady Emily Foley, Stoke Edith Park, Herefordshire (cross).
Second, £5, the Earl of Harrowby, Sandon Hall, Staffordshire (cross-bred shorthorn).
Commended, Mr. Aaron Pike, Mitton (cross shorthorn); Mr. Jonathan Camm, Farnfield, Southwell, Notts (shorthorn cross).

HEIFERS.

First prize, £10, Mr. A. Longmore, Rattie-by-Banff, Banffshire (Aberdeen and shorthorn).
Second, £5, Mr. R. Machin, Papplewick, Nottingham (cross).
Commended, Mr. J. Beasley, Overstone, Northampton (shorthorn and Highland Scot).

SCOTCH BREEDS.

OXEN OR STEERS.

First prize, £10, Mr. W. McCombie, Tillyfour, Aberdeen (Galloway polled).
Second, £5, Mr. E. Rainforth, Monkhopton, Bridgnorth (West Highland).
Commended, Lady Brinckman, Sundorne Castle, Shropshire (West Highland); Mr. W. McCombie (Galloway polled).

WELSH BREEDS.

OXEN OR STEERS.

First prize, £10, and silver medal as breeder, Mr. J. Francis, Manor Farm, Hanging Houghton, Northampton.

EXTRA CLASSES.

For Animals not qualified to compete in any of the Preceding.

OXEN OR STEERS.

[No entry.]

Cows OR HEIFERS.

Prize, £5, Mr. J. H. Langston, M.P. (shorthorn).

SHEEP.

JUDGES.—Mr. J. Moon, Maristow, Plymouth.
Mr. J. B. Spearing, Moulsoford, Wallingford, Berks.
Mr. G. Turner, Barton, Exeter.

LEICESTERS.

Three fat Wethers, not exceeding 22 months old.
First prize £10, extra prize of £10, Hotel and Innkeepers' Silver Plate of £10 10s. as "best pen of long-wools," and silver medal as breeder, Mr. W. Lovel, Nafferton Grange, Driffield.

Second, £5, Mr. J. Boast, North Dalton, Driffield.
Commended, Mr. G. S. Foljambe, Osberton Hall, Worksop, Notts.

LONG-WOOLLED, NOT BEING LEICESTERS.

Three fat Wethers, not exceeding 22 months old.
First prize, £10, and silver medal as breeder, Mr. C. Kearsey, Glewstone, Ross, Herefordshire. (Cotswold.)
Second, £5, Mr. T. West, Greenhill Farm, Bletchington. (Cotswold.)

SOUTH AND OTHER DOWN.

Three fat Wethers, not exceeding 22 months old.
First prize, £10, and silver medal as breeder, Lord Walsingham, Merton Hall, Tactford, Norfolk. (Southdown.)
Second, £5, The Duke of Beaufort, Badminton. (Southdown.)

Highly commended, Lord Walsingham. (Southdown.)
Commended, The Earl of Radnor, Colehill. (Southdown.)

SOUTH AND OTHER DOWN.

Three fat Wethers, exceeding 22, but not exceeding 34 months old.
First prize, £10, extra prize of £10, Hotel and Innkeepers' Silver Plate as "best pen of Shortwools," and silver medal as breeder, Lord Walsingham. (Southdown.)
Second, £5, Mr. J. Overman. (Southdown.)
The class generally commended.

SHROPSHIRE.

Three fat Wethers, not exceeding 22 months old.
First prize, £10, and silver medal as breeder, Mr. E. Holland, M.P., Dumbleton Hall, Evesham.
Second, £5, Mr. Mansell, Adcott, Shropshire.
Commended, The Earl of Aylesford (for two pens).

SHROPSHIRE.

Three fat Wethers, exceeding 22, but not exceeding 34 months old.
First prize, £10, and silver medal as breeder, the Earl of Dartmouth, Patshull, Staffordshire.
Second, £5, The Earl of Dartmouth.

CROSS-BRED.

Three fat Wethers, not exceeding 22 months old.
First prize £10, silver medal, as "best cross breeds," and silver medal as breeder, Mr. J. Overman. (Southdown and Leicester.)
Second, £5, Mr. S. Druce, Abbey Farm, Eyasham, Oxford. (Oxford Down.)

CROSS-BRED.

Three fat Wethers, exceeding 22, but not exceeding 34 months old.
[No Entry.]

PIGS.

JUDGES—Mr. J. Moon, Mariestow, Plymouth.
Mr. J. B. Spearing, Moulford, Wallingford, Berks.
Mr. G. Turner, Barton, Exeter.

Three fat Pigs of one litter, not exceeding ten months old.
First prize, £10, and silver medal as breeder, Mr. G. B. Morland, Chilton Farm, Harwell, Berks.

Second, £5, Mr. E. Sheppard, Roundway Park Farm, Devizes, Wilts.

Three fat Pigs of one litter, not exceeding fifteen months old.
First prize, £10, and silver medal as breeder, the Countess of Chesterfield, Bretby Hall, Burton-upon-Trent.

Second, £5, Mr. T. Crisp, Butley Abbey, Wickham Market, Suffolk.

Highly commended, Mr. G. B. Morland.

Commended, Mr. G. Beale, Frolesworth, Lutterworth.

Fat Pig exceeding fifteen months old.

First prize, £6, and silver medal as breeder, Mr. G. B. Morland, Chilton.

Second, £3, Mr. G. Mangles, Givendale, Ripon.

Highly commended, Mr. G. Beale, for two pens.

Commended, Mr. G. Mumford Sexton, Wherstead Hall, Ipswich; Mr. J. Harrison, jun., Heaton Norris, Stockport; and Mr. G. Mangles, Givendale.

BERKSHIRE BREEDING PIGS.

Five Pigs of one litter, exceeding three and not exceeding six months old.

First prize, £10, and silver medal as breeder, Sir F. L. Holyoake Goodricke, Bart., Studley Castle, Bromsgrove.

Second, £5, Mr. William Cooper, Impsley Farm, Henley-in-Arden.

Third, £3, Mr. W. J. Breach Scott, Queen's Hotel, Birmingham.

Fourth, £2, Mr. J. Smith, Henley-in-Arden.
Silver medal, Sir F. L. Holyoake Goodricke.

Commended, Mr. W. Hewer, Sevenhampton, Highworth, and Mr. J. Spencer, Villiers Hill, Kenilworth.

PIGS OF OTHER LARGE BREEDS.

Five Pigs of one litter, exceeding three and not exceeding six months old.

First prize, £10, and silver medal as breeder, Mr. Andrew Guy, Eaton, Leicestershire.

Second, £5, Mr. G. Thomas Gibbons, White Hill Farm, Tackley, Kirtlington, Oxon.

PIGS OF A SMALL BREED.

Five Pigs of one litter, exceeding three and not exceeding six months old.

First prize, £10, Hotel and Innkeepers' SILVER PLATE of £5 5s., as "best pen of breeding Pigs," and silver medal as breeder, Mr. T. Crisp, Butley Abbey, Wickham Market, Suffolk.

Second, £5, Mr. S. Wiley, Brandsby, Yorkshire.

Silver medal, Mr. S. G. Stearn, Brandeston, Wickham Market, Suffolk.

Commended, Mr. J. Phillips Adams, Link Farm, Worcester, and Mr. G. Mangles.

Disqualified on account of age, Mr. Sexton's entry.

"Birmingham, December 1st, 1860.

"The referees for the ages of stock beg to report that they find the dentition of several of the young pigs not to agree so satisfactorily as they could wish with the statements made in the certificates of their respective owners, and they would suggest to the Council the propriety of having the date on which the pigs were farrowed added, in future, to the certificates. They would also recommend that the present classification be re-considered by the Council, with a view of having breeding pigs *above six months* of age exhibited at the annual meetings of the Society.

"JAS. B. SIMONDS,

Professor of Cattle Pathology, Royal Veterinary College, London.

"R. L. HUNT, M.R.C.V.S.

"To the Council of the Birmingham Cattle Show."

ROOTS.

JUDGE.—Mr. J. Mathews, Edgbaston House, Birmingham.

A Silver Cup, or other article of plate, of the value of ten guineas, by Sir John Ratcliff, for the best collection of the four following varieties:—Long Mangold Wurzel, Globe Mangold Wurzel, Swedes, and Carrots. Six roots of each to be shown, and the roots to be selected from crops of not less than two acres in each case.—Sir William Heathcote, Bart., M.P. Hursley Park, Winchester.

A Silver Cup, of the value of five guineas, by Messrs. Proctor and Ryland, of Birmingham, for the best six specimens of Kohl Rabi, to be shown for this prize alone.—Mr. W. Smith, Woolston, Bletchley Station.

A Silver Cup, or other article of ornamental plate, of the value of five guineas, by Messrs. Griffin, Morris, and Griffin, of Wolverhampton, for the best six specimens of Yellow Globe Mangold Wurzel, to be exhibited for this prize alone.—Mr. Innes, Wroton, near Banbury.

KOHL RABI.

First prize, 2 gs., Mr. W. Smith, Woolston.

Second, 1 g., Mr. G. M'Cann, Court House, Malvern.

Commended.—The Duke of Beaufort, Badminton.

LONG MANGOLD WURZEL.

First prize, 2 gs., Mr. Charles Pratt, Stratford-upon-Avon.

Second, 1 g., Mr. T. Keable, Rowdefield Farm, Devizes.

Commended.—Sir William Heathcote, Bart.; Mr. S. Robinson, Shaw House, Melbourne, Derbyshire; Mr. J. Moore, Northgate-street, Warwick.

GLOBE MANGOLD WURZEL.

First prize, 2 gs., Mr. C. Pratt, Stratford-upon-Avon.

Second, 1 g., Mr. A. H. Johnson, Manor House, Gunnersbury, Middlesex.

Commended.—Mr. J. Eden Tysoe, Rumer Hall, Stratford-upon-Avon; Mr. T. Keable, Rowdefield Farm, Devizes.

SWEDES OF ANY VARIETY.

First prize, 2 gs., Mr. T. R. B. Cartwright, Ayndon, Brackley, Northamptonshire.
 Second, 1 g., Mr. W. Smith, Woolston.
 Commended.—The Duke of Beaufort; the Marquis of Breadalbane, Luining, by Oban, N.B.; Mr. J. Eden Tysoe; Mr. C. Pratt, Stratford.

COMMON TURNIPS.

First prize, 2 gs., Mr. G. Mangles, Givendale, Ripon.
 Second, 1 g., G. B. Morland, Chilton.
 Highly commended.—Mr. William Fletcher, Radmanthwaite, Mansfield, Notts.
 Commended.—The Duke of Portland, Clipstone Park, Mansfield, Notts; Mr. C. Kearsay, Glewstone.

CARROTS OF ANY VARIETY.

First prize, 2 gs., the Duke of Portland.
 Second, 1 g., Mr. T. Keable, Rowdfield.
 Commended.—Mr. G. McCann, Court House, Malvern.

OX CABBAGE.

First prize, 2 gs., Mr. S. Robinson, Shaw House, Melbourne, Derby.
 Second, 1 g., Mr. J. Innes, Wroxtton.

POTATOES.

First prize, 2 gs., Mr. G. Mangles.
 Second, 1 gs., Mr. T. Halford, Newbold, Shipston-upon-Stour.
 Commended.—Mr. S. Robinson, Shaw House; Mr. J. Thompson, Measham, Atherstone.

RUTLAND AGRICULTURAL SOCIETY.

The Thirtieth Annual Exhibition of this Society was opened to the public on Tuesday evening, Dec. 4, the spacious riding-school being well lighted with gas. Considering the very unpropitious weather, there was a good sprinkling of company, which, however, consisted chiefly of residents of Oakham. The exhibition was re-opened at ten o'clock on Wednesday morning, but very few persons attended till after the trials of the hunting horses, which took place in the paddock adjacent to Catmose House. As regards the quality of the stock, this show was equal to those of former years, but in some of the classes there was an evident falling off in the number of entries. This drawback was accounted for by the protracted unfavourable season. Both Mr. Baker's and Lord Gainsborough's are entered for the Smithfield Club Show. It was suggested at the dinner that the Meeting should next year be held in the week *previous* to that at Birmingham; so that the stock might go successively from Oakham to the Midlands, and thence on to London.

The following was the award of the premiums:

STOCK.

For the best ox or steer, of any breed or weight, under five years of age, open to all England, 15*l*.—Mr. R. W. Baker, of Cottesmore. Second best, 7*l*.—the Earl of Gainsborough, of Exton Park. Earl Spencer's ox highly commended.

For the best ox or steer, of any weight, under four years of age, fed within the district, 10*l*.—Mr. R. W. Baker, Second best, 5*l*.—Sir W. de C. Brooke, of Geddington Grange.

For the best cow or heifer of any breed, age, or weight, open to all England, 10*l*.—Mr. T. Chapman, of Whitwell. Second best, 5*l*.—Mr. T. Lester, of Manton.

For the best steer under three years of age, 7*l*.—Mr. R. W. Baker. Second best, 3*l*.—Mr. C. Chapman, of Exton.

For the best steer under two years of age, 5*l*.—Mr. W. Franklin of Barford Lodge. Second best 3*l*.—Mr. R. W. Baker. Mr. S. Wallis' steer commended.

For the best Heifer above two and under three years old at the time of showing, 6*l*.—Mr. R. W. Baker. Second best, 3*l*.—Mr. T. Chapman, of Whitwell.

For the best heifer under two years old at the time of showing, 4*l*.—Mr. R. W. Baker. Second best, 2*l*.—Mr. J. Lynn, of Church Farm, Stroxtton.

For the best cow in milk, 5*l*.—Mr. Searson, of Cranmore Lodge. Second best, 2*l*.—Mr. J. Lynn.

For the best bull above one and under four years old, 10*l*.—Mr. T. Swinger, of Langham. Second best, 5*l*.—Mr. E. Wortley, of Ridlington.

For the best mare for the general purposes of agriculture, 3*l*.—Mr. R. W. Baker.

For the best yearling gelding or filly for the general purposes of agriculture, 3*l*.—Mrs. M. Fryer, of Hambleton.

For the best cow in milk belonging to a tenant occupier of not more than 30 acres of land, 5*l*.—Mr. J. Harris, of Langham.

For the best heifer under three years old at the time of showing, and to be satisfactorily incalved, 4*l*.—Mr. G. Chester, of Waltham. Second best, 2*l*.—Mrs. Jane Harris, of Langham.

For the best heifer calf under six months old at the time of showing, 2*l*.—Mrs. Jane Harris, of Langham. Second best 1*l*.—Mr. N. Needham, of Hambledon.

For the best three long-woolled fat wether sheep, one year old, open to all England, a silver cup, value 10*l*.—the Hon. Colonel Lowther, of Barleythorpe. Second best, 5*l*.—Mr. C. J. Bradshaw, of Burley on the Hill.

For the best three long-woolled fat wether sheep, one year old, 7*l*.—Mr. C. J. Bradshaw, of Burley on the Hill. Second best, 4*l*.—Mr. W. Shipman, of Eaton Lodge.

For the best four long-woolled breeding ewes, 5*l*.—the Hon. Colonel Lowther, of Barleythorpe. Second best, 3*l*.—Mr. C. J. Bradshaw.

For the best four long-woolled theaves, one year old, 4*l*.—the Hon. Colonel Lowther. Second best, 2*l*.—Mr. C. J. Bradshaw.

For the best four long-woolled wether lambs, 3*l*.—Mr. C. J. Bradshaw. Second best, 2*l*.—Colonel Lowther.

For the best four long-woolled ewe lambs, 3*l*.—Mr. C. J. Bradshaw. Second best, 2*l*.—Colonel Lowther.

For the best fat pig of any large breed, 4*l*.—Mr. W. Carver, of Ingarsby. Second best, 2*l*.—Mr. W. Benskin, of Rearsby.

For the best fat pig of any small breed, 4*l*.—Mr. W. Carver. Second best, 2*l*.—Mr. J. Morris.

For the best fat pig of any weight, exhibited by an occupier of not more than thirty acres of land, 2*l*.—Mr. A. Almond, of Oakham. Second best, 1*l*.—Mr. G. Chester, of Waltham.

For the best in-pigged or suckling sow or yelt, 2*l*.—Mr. J. Morris, of The Grange, Oakham.

For the best half-bred four-year-old hunting mare or gelding, exhibited by a farmer, 10*l*.—Mr. W. Bradshaw, of Barrow. Second best, 5*l*.—Mr. E. Wortley, of Ridlington.

For the best beast shown as extra stock, a silver medal, value 3*l*.—Mr. T. Chapman, of Whitwell.

For the best sheep shown as extra stock, a silver medal, value 3*l*.—Mr. R. L. Bradshaw, jun.

ROOTS AND VEGETABLES.

Offered by the Right Hon. Viscount Campden.—For Swedish turnips cultivated on any system, in quantities of not less than five acres, situated within the county of Rutland: First prize, 7*l*.—Colonel Lowther, of Barleythorpe; second, 3*l*.—Mr. W. C. Croxson, of Oakham.

Offered by the Hon. G. J. Noel, M.P.—For Swedish turnips, cultivated on any system, in quantities of not less than ten acres, situated within the county of Rutland, a silver cup, value 10*l*.—Mr. H. Bullivant, of Ashwell. Commended for crop and management: Mr. Hutton, of Tixover.

Offered by the Town and Trade of Oakham—For Swedish turnips cultivated on any system, not less than two acres, situate in the county of Rutland, 3*l*. Mr. T. Swinger, of Langham.

Offered by the Society—For mangold wurzel cultivated on any system, in quantities of not less than one acre, situated within the county of Rutland, a prize of 2*l*. Mr. Suter, of Brooke.

Offered by the Hon. Roden Noel—For mangold wurzel cultivated on any system, in quantities of not less than three acres, situated within the county of Rutland. A prize of 3*l*. Mr. W. R. Morris, of North Luffenham. Commended for crop: Mr. W. H. Bullivant, of Ashwell.

Commended for management: the Earl of Gainsborough, of Exton Park.

Offered by the Society—For cabbages cultivated on any system, in quantities not less than one acre, situated within the county of Rutland, a prize of 1*l*. the Earl of Gainsborough.

Offered by the Town and Trade of Oakham—For turnips (not being swedes), cultivated on any system, in quantities not less than five acres, situated within the county of Rutland, a silver cup, value 5*l*. Mr. E. Wortley, of Ridlington.

For the best specimens of ten Swedish turnips, mangold wurzel, cabbages, and common turnips. (Offered by Mr. R. W. Baker), a prize of 10*s*. Mr. Bullivant, of Ashwell.

IPSWICH FARMERS' CLUB.

The recent annual show and meeting of the Ipswich Farmers' Club was a much more interesting one, in an agricultural point of view, than that of last year. Profiting by our advice on the qualifications requisite for a chairman on such occasions, or perhaps acting upon their own better conception of the fitness of things, the committee chose for that office a practical farmer, who understood what he was talking about, and required no cramming to make a "business" speech. It is very useful and proper to have non-practical men as honorary members of our agricultural clubs and societies, and we thank them for the moral and substantial support they afford to the objects of the institutions; but the appointment of such men to office, whether as chairman, or in committee or council, is a positive evil, because it excludes in the same proportion practical men, who by their advice and judgment could much better forward the objects of the association. In the present instance, instead of a long-winded speech from a chairman whose only practical qualification is the appendage of M.P. to his name, and his capability of speaking against time on any given subject in a general way, there were a dozen short spirited addresses by men, who, without circumlocution, took up the leading agricultural topics of the day, and handled them in a manner that could not fail to prove beneficial to the interests of the Club.

The malt tax was made a prominent subject, and the general feeling was in favour of an unconditional surrender of that impost by the Chancellor of the Exchequer. Mr. W. Gurdon, of Brantham Hall, on the other hand, made some sensible remarks upon the difficulty the Chancellor would experience in giving up five millions of taxation without providing an equivalent of some kind; and he suggested the idea of placing the tax on the cistern, instead of the produce. "He did not wish," he said, "to put the Chancellor of the Exchequer into difficulties; and if something fair could be done towards the agricultural interest, without taking these four or five millions from the revenue, it would be desirable. The farmers did not pay it, the growers of barley did not pay it; it was the consumers of beer who paid it. He was quite willing to argue it upon free trade principles; he was a free-trader. If they raised the price they lessened the demand; and, therefore, if they put £1 1*s*. 8*d*.

upon the malt, they raised the price of beer; and if the tax raised the price of beer, he would ask, would not the farmer have more for his barley if the tax were off? So it was not a question whether or not the consumer paid the tax; it was a question whether the barley would not fetch a higher price." He, therefore, proposed to tax the cistern, instead of the malt; by which means, as Mr. Gurdon assumes, that amount which would be raised would fall in equal proportions upon the barley grower, the maltster, and the consumer.

Another question, raised by the Mayor of Ipswich, was that of the sewage; and, as in duty bound, the worthy functionary expressed a hope that the Ipswich Club would take it up seriously. "Experiments," he said, "had been made in the town, as to how far they could bring the project to bear, of carrying *that* to the farmers which did the town a great deal of harm, and the farmers a great deal of good. The question had been taken up in a good many towns in the kingdom. In Croydon, for instance, they were attempting to raise £30,000 to bring the matter to a practical issue. An experiment had been made in Edinburgh, and he should like to see it made, if possible, in Ipswich. He would like to see 1,000 acres of land down by the river, which belonged to Mr. Tombe, taken for the experiment. At Edinburgh a piece of unprofitable land was taken, and the nightsoil was laid upon it, and it was afterwards let by hundreds of acres at a time at £13 per acre. It would be a good thing if a thousand acres of Rushmere Heath could be brought to a tenancy of the worth of £13 per acre. The town would be glad to pay the farmers handsomely to take this commodity away from it," &c., &c. To this challenge from the worthy Mayor, the chairman, Mr. Manfred Biddell, gave the following reply:—"As to the sewage manure, let it go, and give it God-speed. When he saw it run away from his farm, he wished it God-speed. He had tried it, and he had tried many other things, and he had tried pure water; and he had found pure water the best of the two. He did not wish the sewage question to be given up, but he always wished the sewage clean out of his way. If he blocked it up to keep it in his yard, he must fresh litter his animals three times a-day, and straw was become too valuable for that; so he let it run away, and was glad when it was out of his sight."

There is no question on which men differ so widely as on that of the value of sewage. As a counterfoil to the above observations of Mr. Biddell, we give the following extract from a speech made the day following by Mr. Morrison, *late* of The Links Farm, Malvern, at the meeting of the Hull Board of Health:—"My opinion," he said, "after six years' experience, is, that irrigating with sewage is the finest manure possible for grass-land. The quantity of stock it enables you to keep is surprising; the bite in the fields is much earlier, and continues much later than on non-sewaged land. At Mansfield, the utilization of the sewage has increased the rental value of land from 3s. to £12 per acre per annum; and profitable results have also been obtained in the same way, at Malvern, Croydon, Watford, and elsewhere."

"Who's to decide when doctors disagree?" Of course our readers do not require to be reminded that those "profitable" systems in practice at Watford, Malvern, and elsewhere, have, on examination, been woefully qual-

ified, until the example has really not stood for much. Our own opinion is, that if the sewage of a town can be conveyed to the farm by its own gravitation, it may answer the farmer's purpose to pay for it according to its commercial and chemical value, determined by analysis. But if he has to pay the expense of steam-power, to raise it to a high level to reach his land, it will never answer. If, therefore, any town-council desires to get rid of its sewage by conveying it on to the surrounding farms, the expense of doing it must not enter into consideration in making contracts with the farmers; but they must confine their charge to the intrinsic value of the sewage, as compared with other manures, delivered upon the land.

The Exhibition of Roots at Ipswich was good beyond what could have been expected, considering the season; but we have no room to particularize. Upon the whole the Meeting this year has been a success, and the spirit of enterprise manifested promises fair for the future of the Club.

FRAMLINGHAM FARMERS' CLUB.

The anniversary of this society deserves an honourable place in our history.

The Cattle Hall was the scene of the show. The fowls were ranged round the walls, and the vegetables adorned the tables. The scene was re-assuring: we had almost been taught to think that no good thing had been grown this summer, but these tables told another tale. Both the cheese and butter afforded specimens of much excellence, and were far more satisfactory than they have been for many years. The most remarkable feature in the vegetable show was the potatoes. The "fluke" potato was the hero of the cottagers' productions. There is a history connected with these potatoes which deserves mention, and is illustrative of the spirit of which we have spoken, as animating the members of this club. Mr. Smith, of Easton, purchased some of these potatoes in London, about six years ago, and introduced them into this neighbourhood. He distributed them among the cottages of his parish, and now they are the favourites of the district. Six years is not a long period, but it was long enough here for an enlightened liberality on the one hand, and the absence of prejudice against innovation on the other, to produce the result we saw, with regard to these potatoes. The "flukes" took nearly all the prizes. There were some remarkably fine specimens of onions, and the carrots and parsnips were very good. Altogether the show was of a very satisfactory character, and the Hall was crowded from one o'clock till three by the public.

PRIZE LIST.

Judges of Butter and Cheese: Messrs. Hart, Garrod, Downington, and J. Edwards.

BUTTER, made in June.—For the best lump, without mark, of not less than 6lbs., Mr. R. Capon, of Dennington,

FRESH BUTTER, made at any time in November.—For the best pint, without mark, Mr. R. Capon, Dennington; second best ditto, Mr. E. Gooch, Framlingham.

CHEESE.—For the best Cheese, the produce of a Member's Dairy, Mr. J. Corley, Badingham.

Prize given by J. Gower, Esq., of Badingham, for the best Coomb of Barley, 10s.: best Mr. A. Gleed, of Hoo. Another Coomb of excellent Barley was shown by M. Borrett, of Easton, weighing, with sack, 16 cwt. 1½lb.

SWEEPSTAKES, MEMBERS' PRODUCE.

Judges of Roots: Messrs. E. Gleed, Chambers, W. Barret, C. Capon.

SWEDES.—Mr. Goodwyn Goodwyn, of Framlingham. Red Globe Beet, Mr. T. Cracknell, of Framlingham; Long Red ditto, Mr. Doggett; White Turnips, Mr. D. Smith, of Easton; Yellow Globe Beet, Mr. N. Barthropp, of Creetingham; Long Yellow ditto, Mr. A. Gleed, of Hoo. WHITE WHEAT.—Mr. W. Kent, jun., of Earl Soham. BARLEY.—Mr. A. Gleed, of Hoo. OATS.—Mr. G. Goodwyn, of Framlingham. BEANS.—Mr. A. Gleed, of Hoo. Some very fine turnips and beet were shown by Mr. W. Kent, Jun., of Earl Soham.

SWEEPSTAKES FOR THE BEST THREE ACRES OF BEET.

Judges: Messrs. Gower, Barnes, Walker, Gooch, and Kent.

Best: Mr. Gleed, of Hoo; 17 tons 14 cwt. per acre; number of beet per rod, 109; average weight per single beet, 2½lb. 2nd: Mr. Cracknell, of Framlingham; 14 tons 17 cwt. per acre; number of beet per rod, 81; average weight per single beet, 2½lbs. 3rd: Mr. D. Smith, jun., of Easton; 8 tons 6 cwt. per acre; number per rod, 92. 4th: Mr. Bruce, of Reedham; 7 tons, 6 cwt.; number per rod, 65.

THE MEAT CONSUMPTION OF FRANCE.

The article from the French, published in our last, opens up an interesting inquiry as to the causes of the high price and scarcity of animal food in France. It is one in which we are also somewhat interested, seeing that the production of meat with us scarcely keep pace with the increase of population and wealth, judging by the high prices maintained. The grazier and breeder lay the blame of this enhanced price on the butcher, while the butcher in return retorts upon the breeder. Judging, however, by the wholesale prices current for a series of years past, the retail butcher would certainly seem to be the one who makes the larger profit in these transactions, especially in the metropolis. France is suffering at present under two grievances—a deficiency and high price of bullion, and a scarcity and dearth of the equally essential necessary, animal food.

The article in our last paper observes, "Meat is dear in price, and insufficient in quantity: that is an established fact. It will be so a long time yet, because the number of consumers increases in geometrical proportion, while production progresses, with great trouble, in a proportion simply arithmetical. On the other hand, the removal of the population, which continually increases in the cities, and sensibly diminishes in the rural districts, multiplies the great consumers of meat, at the same time that it takes from the fields a part of the strength necessary to produce it in greater abundance." But the writer, notwithstanding much elaborate theory and general disquisition, does not treat us to anything in the shape of argument or facts to guide our inquiries. Let us then pass under review the progress of meat production and consumption in France, as far as the details are within our reach.

It appears from an account recently published, that the consumption of meat in France, which in 1812 only averaged 17 kilogrammes for each individual per annum is now 54 kilos. In comparison to the number of inhabitants the consumption is greater in towns than in the country parts. Paris consumes 10 kilos. each person more than any other place. Next in quantity comes the north of France, where the average is 64 kilos. each. The two provinces of Poitou and Limousin are those which consume the least, the quantity being only 41 kilos. It is singular that in the departments where the most meat is produced the consumption is the least.

In 1830 the total consumption of butchers' meat was 306,172,965 kilos. of beef and veal, and 87,485,622 kilos. of mutton, giving a total of 393,658,587 kilos., or an average consumption of butchers' meat to each inhabitant of 12½ kilogs. In 1840 the quantity of meat consumed had decreased 15,000,000 kilos., and the average for each inhabitant was then only about 11 kilos. But this did not show the full decrease; for the weights were calculated on the scale of average weight previous to 1830, whereas it was found that the oxen slaughtered had decreased in weight

seven per cent.—cows 16 per cent., and calves 3½ per cent. Sheep had, however, increased in weight a little over 1 per cent.

The diminished consumption and increased price in this period were most remarkable in Paris, Lyons, Rouen, Marseilles, Havre, Bordeaux, and Strasbourg. The average price of beef and veal, weighed alive, was per kilog., in 1822, 87 cents., in 1839 1 franc 9 cents., and in 1841 1 franc 36 cents. From that period to the present time there has been an increase in price of from 40 to 45 per cent. It was thought that when the butcher's trade was thrown open, early in 1858, that of consequence there would necessarily, by competition, be a fall in the price of meat. But this has not been the effect: the price still tends upward, and seems to be caused by the gradual disproportion of the quality and quantity of meat to the annual increase of population.

The importation of foreign cattle, we are told, has also decreased, the raising of the native breeds has not increased, and the consumption has certainly continued its onward march, owing to the improvement in the social condition of the people. Under the influences of these causes, it is easy to foresee that, far from being lower, the price of meat is much more likely to advance than to maintain the present rate, which is already found too high. The Government of France, with all its efforts, has not succeeded in effecting a diminution in prices.

In 1840 the number of oxen in France (exclusive of bulls) was 1,968,800, of which were slaughtered yearly 492,000; of cows, 5,501,800, slaughtered 718,900; of calves, 2,066,800, slaughtered 1,487,400; of sheep 32,151,430, slaughtered 5,804,700.

In Algeria the quantity of stock held by Europeans in 1854 was 21,340 head of cattle, 29,700 sheep, and 800 swine. But this number is insignificant compared to the quantity owned by the Arabs, which numbered 1,031,740 horned stock and 6,850,000 sheep. This ratio in live stock among the natives is attributable to the extent and abundance of pasturage. None, however, of the other colonies of France have any grazing or pasturage capabilities.

In 1846 it was stated in the Journal of the Paris Statistical Society that the domestic animals of France, and their food products annually, were as follows: 9,936,538 head of cattle, &c., which yielded of veal 102,000,000 kilos., of the value of 81,600,000 fr.; 258,356,000 kilos. of beef, of the value of 53,013,000 fr.; and 134,500,000,000 kilogrammes of tallow, valued at 1,345,000,000 fr.; 35,000,000 sheep yielded 525,000,000 kilogrammes of mutton, worth 1 fr. per kilogramme, and 20,292,000,000 kilos. of tallow, worth 202,000,000 fr. The swine numbered about 5,000,000. This estimate appears, however, to have been rather a vague one.

In 1856 the number of cattle for the empire was ap-

proximately returned at 10,000,000; sheep 36,000,000; and pigs 6,000,000.

These last numbers, if at all to be relied on, show a very fair proportion to population, compared with the live stock in the United Kingdom, Austria, and other countries. But the animals are by no means equal in size and weight to those of Great Britain. The progressive increase in proportion to population is also remarkably small. As respects cattle, the increase is kept down by the very large slaughter of calves, unprecedented as compared with other countries. The reason ascribed for this destruction of animal food at the very source is the poverty of the farmers, which compels them to convert their produce into money as quickly as possible. The consequence is that few calves are reared, and the production of meat is continually declining, whilst the price advances and the consumption proportionately diminishes, especially in the Departments.

In 1851 the consumption of meat for Paris (the population then being 1,053,262), was officially stated as follows: Furnished from the abattoirs—beef, veal, mutton, and goats' flesh, 48,353,611 kilogrammes; offal and interior of animals, 904,524 kilos.; pork and lard, 3,631,228 kilos.; offal and interior of animals, &c., 494,266 kilos.; suet and melted fat, 2,874,636 kilos. Furnished from the departments—beef, veal, mutton, and goats' flesh, 11,249,714 kilos.; offal and trimmings, &c., 960,784 kilos.; fresh meat, lard, wild boars, sucking pigs, &c., 5,219,253 kilos.; offal and trimmings, &c., 767,866 kilos.; "charcuterie"—including hams, tongues, sausages, &c.—1,234,054 kilos., making a total of 76,789,936 kilos., equal to 172,777,356 pounds. This gives a proportion of 172½ lbs. of meat and fat per head; but excluding the tallow and entrails, &c., it would be about 159 lbs. per head per annum.

The consumption of London is about 270,000 oxen, 30,000 calves, 1,500,000 sheep, and 30,000 pigs, &c. Comparing this with Paris, we find that the average annual consumption for a population which is only about a third of this metropolis, is 88,000 oxen, 77,000 to 80,000 calves (nearly two-thirds more than are eaten in London), and from 20,000 to 25,000 cows, &c.

M. E. Blanc, a French writer, in his "Mysteries of the Butchery," thus comments upon these figures: "Now, reducing these classes to kilogrammes (2½ lbs.), we find the following difference between the alimentary condition of the two classes. The 270,000 oxen of London are superior in weight to those of the French oxen, and weighing in nett meat a minimum of 400 kilos., allow for the 2,600,000 inhabitants of that city 47 kilos. per head (about 113 lbs.), and the 30,000 calves, a food destitute of all nutritive qualities, 86 grammes only. The 88,000 oxen of Paris, on the contrary, weighing on an average but 345 kilos., allow to the 1,200,000 inhabitants of that city only 25 kilos. 300 grammes per head; and the 77,000 calves, 5 kilos., which makes a difference in favour of the population of London of 24 kilos. 70 grammes of beef per head, and a difference in favour of the population of Paris of

4 kilos. 14 grammes of veal—the former being substantial, and the latter unsubstantial food."

From these figures we find that the entire consumption of beef in Paris in only 66½ lbs. per annum, whilst that of London amounts to 103½ lbs.; the meat of the latter being almost wholly good wholesome ox beef, whilst that of the former consists of a large proportion of diseased and cow beef and veal, the cows being usually both milked and worked until they are past use for either.

In the foregoing statement no account is taken of the sheep and pigs slaughtered in London, which would add at least from 38 lbs. to 40 lbs. per head per annum to the general consumption.

France had in 1840, 32,151,431 sheep, and killed of these in the year 5,804,700 head; but while the number has not very largely increased in the last twenty years, standing now at thirty-six million head, the proportion slaughtered annually appears to have risen to about eight million. In France sheep husbandry is directed more to the production of wool than flesh; hence the return of meat is scarcely half that of our well-fed sheep. It was stated some few years ago that there were 35,000,000 sheep in France: that 4,000,000 head of cattle were annually slaughtered there, of the average weight of 2 cwt., while in England there were not half the number slaughtered, but the average weight was 5 cwt.

The French Minister, M. Rouher, at the Agricultural Show at Poissy, in 1856, said that the consumption of meat in Paris, which in 1846 was 1,240,000 cwts., and in 1851, 1,440,000 cwts., had risen in 1856 to 1,680,000 cwts. The period of the last five years, as compared with the preceding five years, presents an increase of consumption of 24 per cent. for Paris; and the individual consumption, allowing for the increase of population during the same period, has risen from 136 lbs. to 160 lbs., that is from 16 to 17 per cent.

M. Moreau de Jonnes, in his Agricultural Statistics drawn up from official documents, estimated some years ago six millions of sheep as the number annually slaughtered in France; 26 lbs. of mutton as the average yield, and 160,000,000 lbs. of meat as the total produce.

M. de Lavergne, another statistical writer in the *Revue des Deux Mondes* in 1853, raised the estimate, which appeared to him to be too low, to eight millions of head slaughtered, which at the average of 36 lbs. of nett meat, gives 288,000,000 lbs. of mutton.

The number of cattle maintained in France is reckoned at 10,000,000; but although the United Kingdom does not own so many by about two millions, the weight of beef obtained shows our superiority of breeding. In France, the number of cattle annually slaughtered is four millions of head, producing 886,000,000 lbs. of meat, at the rate of 200 lbs. average weight per beast; but other statistics calculate the average weight of the animals at 250 lbs.

In the British Isles, the annual number slaughtered is two millions of head; and this M. Lavergne estimates to yield a total of 1,000,000,000 lbs. of meat, at

the average rate of 500lbs. Among the four millions of animals slaughtered in France figure one-and-a-half millions of calves, which on an average give not more than 60lbs. of meat. Official statistics state the annual production of pork in France at 580,000,000lbs.; but this is considered under the mark, and it is assumed as being at least 800,000,000lbs.

We have thrown together these facts and figures

with the object of affording data for careful deductions by those disposed to follow out the inquiry; for the ratio of progress in live stock and in the consumption of meat per head to the population in various countries of Europe and in our Colonies is a most important inquiry, both as regards the present and the future condition of agriculture and the social condition of the masses.

THE COMPOSITION AND VALUE OF STRAW.

The action of any material employed as a food or as a manure admits of being brought within simple and definite rules, and so long as the conditions are constant the results must be similar. The value of straw has been freely discussed by many of the leading agriculturists of the day, and the opinions held respecting its value differ very widely. This variation in opinions, which are certainly entitled to much respect, naturally induces a feeling of caution when entering upon the subject; but we think the question admits of satisfactory explanation, and that we shall be able to come to a correct conclusion by the combined evidence of Practice and Science. It is important that we should, in the first place, know what materials we have to deal with. Straw is a body varying in its composition, and consequently in its value as food. Statements vary very greatly upon this latter point, and within certain limits these views are supported by modifications in the character of the straw that are readily accounted for. The degree of ripeness at the time of cutting makes a material difference in the composition of the straw. When the plant has made its growth, and comes into bloom, the powers of vegetation are forthwith mainly directed towards the formation of the seed. The stores of food which are needed for the development of the seed are gradually and progressively laid up in this part of the plant, and the protein compounds, which represent the flesh-forming ingredients of the seeds, steadily increase. This is clearly shown by Professor Norton's analyses of the seed of oats at different stages of their growth:

	July 30.	Aug. 13.	Aug. 27.	Sept. 3.
Protein compounds...	8.50	8.69	11.26	13.84

This increase in the protein compounds, or the nutritive matter of the oat, arises from an accumulation, and also from a concentration—the former resulting from the food daily received by the plant, and the latter from the energies of life being directed to the main object of the plant's existence—the formation of seed. Every portion of the plant surrenders to the more powerful claims of the seed, and thus the increase of nutritive matter in the seed is attended by a decrease of the nutritive matter in other parts of the plant. This continues until the time of the seed becoming fully ripe, and the straw is thus daily more and more impoverished by the seed. For such a reason, when the corn is allowed to become thoroughly ripe before it is cut, the straw is reduced to its lowest nutritive value; but if cut before

the seed has thus drawn upon it, we then find it possessing higher feeding powers, and this increase is proportioned to the time at which the cutting precedes the seeds becoming ripe. There is not a more striking illustration of this difference than in the straw of peas, grown for being picked and sold as green peas for table use, and those which remain for harvesting in the ordinary manner; the straw of the former is equal to good hay, whilst the latter is very inferior. We are also familiar with the difference as indicated by the eager manner with which stock will consume the straw of unripe corn, when they reject that which has been fully ripened. Their delicacy of palate indicates a difference in nutritive value as accurately as a chemical examination can; for we have to form our opinions upon the result of the latter, and we must acknowledge that we are more liable to error in forming our conclusions than the indications of appetite. Variations in the composition must of necessity arise according to the circumstances of growth, and this influence of the grain upon the straw during the latter stages of its ripening will be found to affect every variety grown. Those who are in the habit of cutting in the least ripe condition will always have the best straw; and *vice versa*.

This change is not confined to the protein compounds. The circulating sap conveys also dextrin and oily materials. These are equally subject to the controlling power of the seed, and we have exactly the same appropriation carried out as we have observed in respect to the nutritive ingredients. As the sap passes into the grain, the evaporation of its watery portion is completed, and the dextrin and oily matters which may be present are added to the grain, and become stored away, principally as starch and oil. The influence upon the straw is manifest, for the more ripe the corn becomes before it is cut, the more completely does the straw become robbed of dextrin and oil, and thus the straw has less fattening matter remaining in it. So that we are justified in considering that the nutritive and fattening properties of straw are much regulated by its ripeness at the time of cutting.

It is interesting to observe the change which takes place in the mineral composition of the straw and leaf during the ripening of the seed. The most complete investigation which we have is that conducted by Prof. Norton. The analyses were made at intervals of seven days each, from the 4th of June to the 16th of July, and present a beautiful illustration of the regularly

progressive changes which the sap undergoes. For the convenience of the reader we have only given the first and last analyses of the leaf and straw, and to this is added the analyses of oat straw when fully ripe.

	ANALYSES OF OAT LEAVES.		ANALYSES OF OAT STRAW.			
	June 4.	July 16.	June 4.	July 16.	Ripe.	
Silica	16.58	58.22	16.29	34.85	49.56	
Phosphoric acid ..	16.16	2.91	16.15	6.31	5.07	
Sulphuric acid.....	11.74	13.05	6.15	7.84	8.35	
Lime	8.44	5.13	2.40	4.12	7.01	
Magnesia	5.33	1.63	.88	1.47	3.79	
Peroxide of iron ..	.61	.55	.39	.62	1.49	
Potash and soda...	24.60	18.35	24.94	40.66	21.39	
Chloride of sodium and potassium ..	16.34	.31	32.66	4.46	6.93	

These analyses show some remarkable changes in the mineral matter present. The leaf and stalk on the 4th of June in many respects show a similarity of composition; but after this the leaf appears to go through its changes more rapidly than the stalk. We observe the plant gradually surrendering its phosphoric acid and its alkalies, potash and soda, for the grain, and increasing in its proportion of silicates, upon which it relies for strength and protection. The large increase of potash and soda in the stalk on the 16th of July may be traced to the vigorous action of the plant in supplying these bodies to the seed, rather than to any increased deposit at this time. An early cutting therefore modifies the composition of the ash, and would in some degree improve its value as a manure, but have little influence on its nutritive powers.

The climate of the district in which corn may be grown exerts a very powerful influence upon the quality of straw. Oat straw grown in the North of England and Scotland is very different in quality from that grown in the South and East of England, and the same with other kinds of straw. The feeding quality of straw will generally be found to be best when grown in the district best suited for the successful growth of the corn it bears. Thus, upon high, cold, and exposed tracts of land, rye straw is very superior, and preferred by stock to any other kind of straw. Oat straw often contests this preference, and, as the land gets stronger in character, the latter gradually becomes superior. In other districts both of these are considered inferior to wheat and barley straw; so that there is no constancy in the preference shown for either variety. It may, however, be inquired if this prejudice in different localities can be taken as evidence of variation in feeding qualities? It is believed by some persons that the preference shown by stock is *at the present time* more satisfactory evidence of variation in feeding value than any other tests we can apply; and we must admit that we know but little just now of the feeding value of any body except as the result of actual experiment, and these results contradict the general opinions held with respect to the estimation of their feeding powers. For this reason—taking the indication given by stock in preferring different kinds of straw in different districts, as proof—the value of straw as food does change, according as the soil and climate become more or less suitable for its growth.

The organic analyses of straw which have been published, show that the different varieties vary but little in general composition.

	Per cent.	Mean.
The nitrogenised matter varies from	1.87 to 2.5	2.19
The carbonaceous	91.3 to 94.53	92.6

These are comparatively close results, but we have reason to believe that the composition of straw varies as much, if not more, in the same variety, as it appears to do between different varieties; that the influence of soil, climate, and ripeness at the time of cutting make greater differences than are here shown to result from distinct varieties. We may, however, examine into these analyses, and inquire what is represented by the two classes of bodies respectively distinguished as the nitrogenised and carbonaceous groups. The nitrogenised group consists chiefly of albuminous matter, and we may fairly consider straw to possess on the average 2.19 per cent. of flesh-forming food. The carbonaceous group does not consist of matter in an equally available form. In the early growth of vegetable matter we have a body present known as cellulose, and of such the cells of the plant are built up. This matter may, under certain conditions, be retransformed into starch and sugar, and become useful for the support of animal heat, and the formation of fat; but in proportion as the plant gets older, this cellulose becomes charged with incrusting matter; its character alters, and it becomes known as *woody fibre*. This cannot be rendered available for the wants of the body by means of digestion. Although the elementary composition of this carbonaceous matter differs but slightly from that of starch, gum, sugar, and oil, and may, under the action of powerful chemical agents, be transformed into the former of them; still the mild action of the digestive powers do not render it available as food. Any carbonaceous matter which may exist in its earlier stage, either as oil, dextrin, starch, or sugar, would be readily available; but having passed through these conditions, and become appropriated by the plant in a more advanced stage of transformation, it cannot be brought back again so as to be available for the purposes of animal life, except by a decay which will not take place in the body. The 92.6 per cent. of carbonaceous ingredients comprise a large quantity of matter which cannot take part in nourishing the body; and in order that we may judge rightly on the matter, we need information respecting the constituents which are thus grouped together. Professor Johnston has quoted some analyses of Dr. Sprengel respecting the composition of wheat, barley, and rye straw, as nearly identical in composition; but more recent analyses by Mr. Nesbit give a very different estimate of their ingredients. We shall take an early opportunity of pursuing this inquiry, so as to show its influence upon the absolute feeding value of straw.

THE YEAR'S PROGRESS.

The approaching year brings round the appointed decennial period for taking the Census in the kingdom ; and it will be an interesting feature to notice what has been the progress made by the agricultural class—what relative position it now bears, as to numbers, to the other industrial occupations of the country, and what are the marked features of advance or decline in improvements of land, cultivation, machinery, live stock, and other heads. It is premature, perhaps, to enter into anything like an inquiry, particularly when founded upon mere estimates or imperfect and incomplete data. This inquiry, however, will come at a most interesting period, because we shall be able to institute a comparison of agricultural progress with our brethren on the other side of the Atlantic. The American Census has just been taken, and will be much more full and complete in all its heads of inquiry (judging from the nature of the forms) than we can expect to obtain in this country. But whether, looking at the machinery employed, and the vast field of inquiry to be covered, that it will be half so accurate as our own, is quite another matter. By attempting too much, the American Government will fail to ensure that uniformity which is so essential in such official investigations.

Another reason why the Census returns of 1861 will be of interest, is, that in the following year we are to have another International Exhibition ; and it will be well to be able to show our friends and visitors what has been done here in national improvement as regards the cultivation of the soil, the comparative yield, the rearing and increase of stock, the economy of labour, beneficial modes of cultivation, and harvesting our crops ; approved novelties in machinery, and the general results attained from improved skill and chemical research. In all that relates to agricultural improvement, by comparison with other nations, and in friendly competition, let us be able at least to hold our place, even if we do not—as we ought to do—excel. While we have been sending forth to every part of the world improved agricultural implements and steam-engines, and improved stock, let us show that we have gone on improving year by year, and that ten years' skill, capital, and experimental research have not been thrown away. The field of inquiry over such a period, and embracing so many subjects, is much too wide to do justice to in one article.

If we glance at the improvements in agricultural implements and machinery, we shall find a very great progress has been made, and attended with vast economy of time and money, whether it be in the more general adoption of cultivators, scarifiers, &c.—three and four times the breadth of ploughs, over the old system of ploughing—the more general use of horse-hoes, sowing-machines, and drills. Field steam-engines, too, have superseded the old horse-threshing machines, at a reduction of time and expense of fully

one-third. There are now from 20,000 to 30,000 steam-engines employed on the farms of the kingdom, and this number is being every day added to, with consequent advantage of increasing the labour-power and performing the work more quickly. What should we have done, in many instances of late, without the reaping-machines, which have been so useful ? Something has been done, too, with steam-ploughs and traction-engines, with endless rails and other contrivances ; although much yet remains to be done in this direction, and in the more general adoption of steam to farm-culture and farm operations. Portable combined thrashing machines with finishing dressing-machines, and many other novelties, are evidences of the practical skill of our machinists, and of their appreciation and adoption by the farming interest. The increased demand for oilcake-breakers and bone-mills marks an era in the use of these important aids to the farmers. Ten years ago, oilcake as an article of import was scarcely mentioned, either for feeding or manure. now our imports exceed 95,000 tons, besides what is made at home : and of bones we also obtain foreign supplies to the extent of 85,000 tons. So with nitrate of soda, largely used for the soil, our imports have doubled in ten years, reaching now 48,250 tons, of which probably one-half is employed as a fertilizer. Our guano imports have also doubled. Coprolites were scarcely known ten or twelve years ago ; and now 30,000 tons are raised annually (according to Mr. Robert Hunt's statements) from Cambridge and Suffolk, besides others imported from France and Belgium. Indeed, in nothing has there been a more marked advance than in the extended manufacture and general use of artificial manures, which have had so beneficial an effect on the increase of our crops.

The improvements effected in drainage, in manuring, and in more skilful cultivation and cropping, it would be most difficult to fully appraise. But those who have had opportunities of traversing the country can best estimate the remarkable improvements thus effected.

It is by means of these improvements in tillage and implements that, with an increased population of 3,000,000 souls, we have yet been able to meet their food wants, with scarcely any addition to our foreign imports. The foreign supplies of wheat in 1850, in round numbers, were 3,739,000 quarters, and of flour 3,820,000 cwt. In 1859 the imports were, wheat 4,000,000 quarters, and flour 3,328,000 cwt. And it should be remembered that the manufacturing industries draw somewhat largely upon wheat supplies now to what they did then, in the increased demand for starch for laundry purposes, for stiffening fabrics, for gum-labels, &c. The consumption of starch cannot be less than 30,000 or 40,000 tons a-year, principally from wheat, which involves a large consumption of grain,

The railway extension of the kingdom has been another medium by which agriculture has been materially benefited. In 1850 there were but 6,733 miles of railway open; last year the extent of lines had increased to nearly 10,000 miles in operation. These have been greatly instrumental in bringing remote districts into more close communication, and in affording facilities for the transport of agricultural produce, live stock, machinery, &c., and for the receipt of manures, stone, timber, and other supplies. Many districts are, however, yet remote from railway stations, and it is a question whether light tramways might not be conveniently laid down in some localities where an expensive railway would not pay; and whether it is not possible for the farmer to employ the steam-power at his command with greater economy and effect upon the land, in preparing and in conveying his farm-produce to market.

It was stated in the last Census report, that one of the obvious physical effects of the increase of population in the kingdom is, that the proportion of land to each person diminishes; and the decrease has been such, that, in the first half of the present century, the number of acres to each person living has fallen from 5.4 to 2.7 acres in Great Britain; from 4 to 2 acres in England and Wales. As the population in the last ten years is estimated to have increased 3,000,000, this relative proportion of land to each has consequently been further reduced. As a countervailing advantage, the people have been brought into each other's neighbourhood; their average distance from each other has been reduced at the ratio of 3 to 2; labour has been divided; industry has been organized in towns: and the quantity of produce, either consisting of, or exchangeable for, the commercial elegancies and necessities of life, has, in the mass, largely increased, and is increasing at a more rapid rate than the population.

The aggregate number estimated as employed in agriculture, in 1851, exceeded 2,000,000—half a million more than those engaged in manufactures, and only half a million below those engaged in trade. In looking at the figures, we are necessarily struck by the great number of farmers returned. Two considerations, however, help to explain this. First, the numbers returned include those who have retired, as well as those engaged in agricultural pursuits at present; secondly, a large proportion (about fifty thousand) are merely occupiers of small plots of land, from less than five up to twenty acres. The nearest relations of farmers, if aged fifteen years or more, and resident on the

farm, are placed by the Census in the agricultural class, as it is presumed they are more or less engaged in farming pursuits. There were 1,200,000 out-door agricultural labourers returned in 1851.

In Scotland, the number of farmers and of holdings returned was 56,650, and of pasture or moor-land 1,662,491 acres, in the hands of 3,203 holders. The number of men employed as labourers was 33,512, and of women 8,195. In the islands on the British seas, the number of farms and farmers was 3,968, who employed 2,886 men and 32 women as labourers.

Next year we shall probably be able to institute a comparison as to numbers between the present and the past, and to note what effect emigration, and the improved social condition of the masses, have had upon the labour question. The increase of live stock in the ten years will be another interesting investigation as bearing upon the food supply; and we shall be able to judge whether cattle-breeding and sheep-raising keep pace with the larger wants of the community.

We know that, in Ireland, in the ten years, the cattle have increased by 1,000,000; the sheep and pigs have doubled. The increase in horses there has been much smaller, only amounting to about 10,000 increase. We have also some data for Scotland.

In 1850, the number of horses in Great Britain, as far as can be ascertained, belonging to farmers, was, 308,573 used solely for husbandry; 30,848 usually employed for husbandry, although occasionally in drawing burthens; employed by market-gardeners 2,290; by bailiffs and herdsmen 1,486; horses never having been used 19,136, and breeding mares 3,331. These, with perhaps a few thousands under other classes omitted, make a total of about 370,000 horses employed in husbandry, and the total number of all kinds, including young horses, ponies, and colts, was considered to be about 700,000. What the present number is it would be difficult to state. Ireland, however, has about 560,000; Scotland 190,000. In 1851, Mr. Pool estimated that there were 4,200,000 head of cattle, 28,500,000 sheep, and 1,500,000 pigs in Great Britain.

It is needless to follow out these guess-work estimates; for is to be hoped that we may have, before another year runs out, some reliable data as to the special and aggregate value of our land under culture, the extent of the crops raised, and the live stock maintained, which may afford an index of our present agricultural wealth, and of the progress made by the enterprise, capital, and persevering industry of our farmers and graziers in the last ten years.

THE SHROPSHIRE SHEEP AT BIRMINGHAM.

SIR,—I cannot allow the few remarks, relative to Shropshire sheep, in your late article on the Birmingham Show to pass altogether unnoticed.

“The trump card of all the sheep was of course again the Shropshire. The class, indeed, was thought to be too good for the judges, amongst whom there was not one breeder

of the Shropshire, and common opinion did not go altogether with the awards. The first prize for the younger wethers they gave to some handsome sheep of Mr. Holland's, and the second to a useful lot of Mr. Mansell's; and had they stopped here all might have been well enough. But they went out of their way to commend two pens of Lord

Aylesford's, really as it would seem for no other reason than that they were Lord Aylesford's. Sheep with plain coarse heads, very middling frames, and 'frills' and fronts of dark wool, and 'scuts' as black as night—the most unsaleable of so saleable a commodity. Then both the first and second prizes for the older wethers went to Lord Dartmouth for some true and straight useful farmers' sheep, while they utterly ignored Mr. Orme Foster's magnificent lots, one of which certainly included the best Shropshire in the Show. If Lord Aylesford's were worth commending at all, Mr. Foster's, Mr. Smith's, and Mr. Holland's other pen were far more so. For the future it will be better to have, at least one Shropshire man as a judge of Shropshires, and there are many who do not exhibit. This breed, it must be remembered, are the first both in point of excellence and numbers of all the sheep shown in Bingley Hall; and two Devonians and a gentleman from Berkshire were called in to pronounce upon them. The same trio tried their hands with more success on the swine, all three, if we place them aright, having some position as pig-men." From my own observation, and from the expression of feeling by the public generally, never were words more appropriately or truthfully penned than the above; and as I take considerable interest in the class of "trump cards," I will, if you please, give you a few measurements of the sheep in the principal pens, which I think will bear out the writer in your paper in his observations, and tend at least to show the sole reason why pens 135 and 136 were commended, viz.: *Because they were Lord Aylesford's.*

SHROPSHIRE SHEEP.

YEARLINGS.

No. 132. Mr. Holland's.—First Prize.

Length.	Girth.	Length.	Girth.
Ft. in.	Ft. in.	Ft. in.	Ft. in.
2 11 × 5 2	} 8 3 × 15 7		
2 8 × 5 3			
2 8 × 5 2			

No. 133. Mr. Holland's—

2 7 × 5 0	} 8 1 × 15 1
2 8 × 5 1	
2 10 × 5 0	

No. 134. Mr. Henry Smith's—

2 10 × 5 1	} 8 5 × 15 11
2 10 × 5 4	
2 9 × 5 6	

No. 135. Lord Aylesford's (Commended)—

2 7 × 5 0	} 7 8 × 14 11
2 6 × 4 11	
2 7 × 5 0	

No. 139. Mr. Mansell's.—Second Prize.—

2 7 × 5 4	} 7 10 × 16 2
2 7 × 5 5	
2 8 × 5 5	

ABOVE 22 MONTHS.

No. 143. Lord Dartmouth's.—Second Prize.—

3 0 × 5 3	} 8 3 × 15 9
2 8 × 5 2	
2 7 × 5 4	

No. 144. Lord Dartmouth's.—First Prize.—

3 0 × 5 3½	} 8 10 × 16 4½
3 0 × 5 7	
2 10 × 5 6	

No. 146. Mr. W. O. Foster's.—

2 9 × 5 3½	} 8 1 × 15 11½
2 8 × 5 5	
2 8 × 5 3	

No. 147. Mr. W. O. Foster's.—

3 0 × 5 7	} 8 10 × 16 9
2 9 × 5 5	
3 1 × 5 9	

Unquestionably, Mr. Editor, if Bingley Hall has a weak point, it is in the show of sheep, and it does seem strange that the class of sheep forming the chief attraction of the yard, if not in usefulness at any rate numerically, should not

have at least one man in the trio of judges who would be likely to know what a Shropshire sheep is or should be; and one who should he fail in exactly telling the best, would certainly avoid the mistake of going out of the way to commend animals that, to say nothing of Bingley Hall, would have been ridiculed at any local show in the county of Salop.

Why, sir, is it necessary that absolute wisdom should only exist in the craniums of the magical number three, and that the judges at Birmingham must form a trio? I know ample funds can be found for a fourth man, and then appropriate two sheep breeders to the sheep class, and the other two to perform the duties incumbent on the porcine department; and in cases of difficulty a third may readily be called in as referee from either stock department in the yard.

As regards how the judges are to be chosen, those sheep or cattle which numerically form, from their contiguity to the district where they are produced, a leading and prominent feature in the show, should have judgment pronounced on them by men having a thorough knowledge of the animal; and I flatter myself as a proud Salopian, that Shropshire can furnish as readily men of integrity and intelligence to perform this office, as their brother farmers can raise and bring to perfection that class of animal, which is rapidly making way in every land where food and clothing is required—the Shropshire sheep.

ENTRIES OF SHEEP, BINGLEY HALL.

1859.

	Yearling.	Two-shear.	Total.
Leicesters...	5 ..	0 ..	5
Cotswold...	3 ..	0 ..	3
Southdown ..	3 ..	8 ..	11
Shropshire ..	9 ..	7 ..	16
Cross-bred ..	9 ..	0 ..	9

1860.

	Yearling.	Two-shear.	Total.
Leicesters...	8 ..	0 ..	8
Cotswold...	5 ..	0 ..	5
Southdown ..	5 ..	6 ..	11
Shropshire ..	11 ..	5 ..	16
Cross-bred ..	2 ..	0 ..	2

Looking at the above figures, I will leave the public to judge how far the Shropshire sheep deserve consideration in this matter, and conclude by venturing to hope that we shall see better things next year; feeling assured that if the decisions of 1860 are to form a precedent, the entries of stock from tenant-farmers and one-pound subscribers will rapidly dwindle away.—I am, Sir, truly yours,

A SHROPSHIRE SHEEP BREEDER.

Dec. 14.

THE IMPROVEMENT OF INFERIOR GRASS LAND.

SIR,—I venture to offer one or two remarks from my own experience with reference to the improvement of inferior grass land, on which subject there is an article in the supplement to your paper of the 26th inst.

In laying down land to permanent grass, it is well known that after the various seeds are sown (and more particularly on strong tenacious soil) the first year's herbage is invariably the best, and that in every succeeding year the coarser grasses predominate, whilst the finer ones become by degrees apparently extinct. The latter cannot make any growth, though the stronger and coarser grasses seem to make their way and to choke up the finer ones. The application of manures fails to improve the quality of the herbage so much as might na-

turally be expected. Perhaps the following circumstance may serve to throw some light upon the matter. Many years ago, I was desirous of ploughing out some grass land; but on sending a man to commence the work, he accidentally began in the wrong field, where he ploughed nearly half an acre. This was in the autumn, and the land remained as it was throughout the winter; but in the spring I had it carefully turned back and rolled. Owing to this piece being laid open to the weather through the winter, and the roots of the grasses being thoroughly exposed to the atmosphere, the

quality of the herbage and quantity of grass on the land were so extraordinarily improved, that the exact line where the plough had gone might be easily seen for twenty years afterwards. If treatment of this description were now tried upon grass land, and an application made of about 4 tons of lime with 7 cwt. of salt (mixed about three months previously, and kept in a dry place), I believe it would be found to have a very beneficial effect towards the desired improvement.

I remain, Sir, yours very faithfully,

Nov. 29.

AN OLD AGRICULTURIST.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL: Dec. 5.—Present: The Earl of Powis, President, in the Chair. Lord Walsingham, Hon. W. G. Cavendish, M.P., Hon. Colonel Hood, Hon. A. Vernon, Mr. Raymond Barker, Mr. Barthropp, Mr. Caldwell, Colonel Challoner, Mr. Druce, Mr. Frere, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Humberston, M.P., Mr. Lawes, Mr. Shuttleworth, Mr. Thompson, M.P., Mr. Torr, Colonel Towneley, Mr. Turner (of Barton), Dr. Voelcker, Mr. Owen Wallis, Mr. Jonas Webb, and Mr. Henry Wilson.

The following new members were elected:—

Barses, C., Chorley Wood House, Rickmansworth.
Beale, T. T., 237, High Holborn.
Campbell, R., Bauscot Park, Faringdon.
Cochrane, James, Harburn, Edinburgh.
Couchman, John William, Tottenham Green, Tottenham, Middlesex.
Daubeny, E., Cleve House, Bristol.
Daubeny, R., King's Bench Walk, Temple, E.C.
Disraeli, Right Hon. B., M.P., Hughenden Manor, Bucks.
Elkington, H., Woodbrook, Northfield, Birmingham.
Farrer, O. W., Hamilton Place, Piccadilly, W.
Fox, William, Dunston, Seaford.
Gillett, J., Fawley, Charlbury.
Giraud, Edward, Preston, Wingham.
Hanbury, Edgar, Eastrop, Highworth.
Heasman, Alfred, Augmering, Arundel.
Holloway, T., Sunningdale, Berks.
Killick, A., Deepdene Park Farm, Dorking.
Jekyll, John, Dunston, Seaford.
Minett, J. E., Arley, Coventry.
Moscrop, W. J., Buscot Park, Faringdon.
Pretymann, A., Plaslynnon, Llanfair, Anglesey.
Pusey, S. E. B., Pewsey House, Faringdon.
Ralston, W. H., Keele, Newcastle.
Rumbold, C. J. A., 5, Percival Terrace, Brighton.
Smith, Mr. S. Haddlesax, near Selby, Yorkshire.
Spencer, Right Hon. Earl Althorp, Northampton.
Tempest, R. F., Ackworth Grange, Pontefract.
Tennant, J., Riddings, Settle.
Wicksteed, Rev. C., Hafod, St. Asaph.
Wilson, T., Woodhorn, Manor House, Morpeth.
Wombwell, Sir George, Newburgh, Easingwold, Yorkshire.
Zoeppritz, George, Ravensbury, Germany.

FINANCES.—The Hon. Colonel Hood presented the report of the Finance Committee, from which it appeared that the current cash balance in the hands of the bankers on the 30th ult., was £886 18s. 11d. The Secretary's receipts during the past month were duly examined and found correct.

The Committee begged leave to suggest that the thanks of the Council be given to Mr. Manning for his active exertions in winding up the affairs of the late

Secretary, Mr. Hudson, thus securing to the Society a large dividend on the amount due. The report was unanimously adopted.

On the Report of the Chairman of the Journal Committee, the Council resolved that the following rule be adopted in the case of Reports of Judges of Implements:—

That the Editor be requested to correct any inaccuracies of style and clerical errors. That the Consulting Engineer be requested to correct any inaccuracies in the description of the machinery, or the records of the working of the Implements; but that any alteration in the report of a Judge of Implements which is not included under either of the foregoing heads, shall be submitted to the acting Senior Steward and the Chairman of the Journal Committee, and shall not be adopted without their approval.

The standing committee for 1861 were then appointed. Colonel Challoner, Chairman of the Implement Committee, presented the report, the recommendations of which were adopted as follows.

LIST OF PRIZES FOR THE LEEDS MEETING.

For the Classes of Drills:—

1. Corn or general purpose drills	..	..	..	£30
2. Corn—for small occupations	..	..	..	10
3. Turnips and other roots	..	..	..	30
4. Water drills	..	..	..	10
5. Drills for small seeds	..	..	..	10
6. Drill presses	..	..	..	10

Two classes of Manure Distributors:—

1. Distributors for dry manure	..	..	..	10
2. " for liquid manure	..	..	..	10

Horse-Hoes:—

1. Horse-hoes for general purposes	..	..	..	15
2. Single row horse-hoes for ridge or flat	..	..	..	10
3. Horse-hoes for thinning turnips	..	..	..	5

Mowing Machines for natural and artificial Grasses .. 20

Hay-making Machines 10

Reaping Machines:—

1. For cutting, with self-delivery	..	..	..	20
2. For cutting the corn, without self-delivery	..	..	..	10
3. Combined reaping and grass mowing	..	..	..	20

Horse Rakes 10

Pair-horse Waggonns 10

Other Waggonns 10

Single-horse Carts 10

Two-horse Carts 10

Harvest Carts 5

Market Carts on springs 5

Miscellaneous awards to agricultural articles and essential improvements therein (10 medals) 20

The application of steam power for the cultivation of the soil 100

Ditto, ditto, worked by an ordinary portable engine, not exceeding 10-horse power 100

It is recommended that the actual trials of the steam cultivators shall commence in the third week in June,

and that 100 acres of land should be provided by the Local Committees, who were requested to ascertain immediately what land they can procure, and the condition they can place it in so as to represent as near as possible autumn cultivation.

All Cultivators must be again exhibited at work during the Show under the direction of the Stewards.

Exhibitors intending to send Steam Cultivators shall especially enter the same, with specifications, on or before the 1st of May.

The preliminary arrangements for the Leeds Meeting were reported as progressing satisfactorily.

On the nomination of Mr. T. Raymond Barker, the Duke of Marlborough was unanimously elected to supply the vacancy in the Class of Trustees, created by the death of the Duke of Richmond.

A Special Committee was appointed at the suggestion of Mr. Fisher Hobbs for the purpose of recommending additions and alterations in the Bye-laws and Resolutions of Council.

The Council then adjourned to Tuesday, December 11, at 11 A.M., when it is specially summoned by the President.

SPECIAL COUNCIL, Tuesday, Dec. 11.—Present: the Earl of Powis, President, in the chair; Lord Berners, Lord Tredegar, Hon. Col. Hood, Mr. Barnett, Mr. Barthropp, Mr. Bramston, M.P., Col. Challoner, Mr. Druce, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Howard, Mr. Jonas, Mr. Milward, Mr. Pain, Mr. Pope, Mr. Robert Smith, Mr. Torr, Mr. Owen Wallis, Mr. Jonas Webb, Mr. Burch Western, and Mr. Henry Wilson.

The Resolution of Council of the 7th November, 1860, was then by unanimous consent altered, and the price of admission at the Leeds meeting on the Tuesday, was fixed at 2s. 6d. instead of 5s.

Lord Berners requested leave to draw the attention of the meeting to the fact that, it being the general opinion that all who knew the frank, kind, and amiable character of the late Duke of Richmond, and who had observed his career as a gallant and distinguished soldier, as Lord-Lieutenant of the County of Sussex, as a zealous supporter of the interests and improvements of agriculture, as member of both Houses of Parliament, and in every relation of life, will desire to record their opinion and express their feelings by erecting a lasting memorial to his worth. With a view to carrying out this object the following county gentlemen have formed themselves into a Provisional Committee for West Sussex:—The Hon. H. Wyndham, M.P., chairman; the High Sheriff of Sussex, the Hon. J. J. Carnegie, the Rev. Sir George Shiffner, Bart., George Barttelot, Esq., Richard Prime, Esq., Major Sandham, William Townley Mitford, Esq., M.P., the Rev. John Goring. Subscriptions not to exceed £3 3s., to be paid into the London and County Bank, Lombard-street, or one of its branches.

The Council re-assembled at half-past eleven o'clock, to which hour it had been adjourned on the 5th instant, when the Report of the Live Stock Prizes Committee was adopted, and the Stock Prize Sheet for the Leeds Meeting was finally settled.

The Council then adjourned over the Christmas recess till the first Wednesday in February.

THE HALF-YEARLY MEETING

Took place in Hanover-square on the Wednesday in the

Smithfield week at twelve o'clock, the Earl of Powis as President in the chair. Amongst others also present there were Lord Berners, Lord Walsingham, Sir J. V. Shelley, M.P., Sir W. Brooke, Mr. Langston, M.P., Mr. Fisher Hobbs, Mr. Owen Wallis, Mr. Raymond Barker, Mr. Barthropp, Mr. Caldwell, Mr. James Howard, Mr. Jonas Webb, Mr. S. Jonas, Mr. Pope, Mr. C. Stokes, Mr. T. B. Western, Mr. Torr, Colonel Brice, Professor Voelcker, Mr. H. Wilson, Mr. Cuthbert Johnson, Mr. H. Corbet, Mr. Astbury, Mr. S. Sidney, Mr. J. C. Morton, Professor Simonds, Mr. Godwin, Mr. Jonathan Grey, Mr. Baines, Mr. Ryder, Mr. Packe, Mr. Mumford, Mr. Arkell, Mr. Saunders, Mr. R. Clarke, Mr. Stephens, and Mr. Frere, editor of the Society's Journal.

The CHAIRMAN, in opening the proceedings, said he felt confident that the Royal Agricultural Society, in common with the Smithfield Club and other kindred societies which met in London at this season of the year, would join with him in the regret he now expressed at the loss they had recently sustained by the decease of the late Duke of Richmond (Hear, hear). His grace had been president for life of the Smithfield Club, and he had three times filled the office of president to this Society, to which no person was eligible for re-election until the expiration of three years from the time he last filled the office. His grace had always paid close attention to the business of the Society from its earliest days: at all times he had taken a great share in the show-yard as an exhibitor and practical farmer; and in every matter in connection with the Society, whether as a farmer or a public man, he had been ever anxious to promote the interests of agriculture (Hear, hear). He (the Chairman) was happy to say that the accounts of the Society were this year in a highly satisfactory state. They had been duly audited by the Society's auditors, after having been submitted to and approved by Messrs. Quilter and Ball, the public accountants (Hear, hear). With respect to the late meeting at Canterbury, they would probably not be surprised to hear that that event would entail some cost upon the Society's funds. From the peculiar situation of the county of Kent, surrounded as it was by the sea on two sides, the distances which many persons had to travel were much greater than at either Chester or Warwick; and although Kent was a populous district, it was not in immediate communication with such masses of population as existed in the two last places at which the Society had held its shows. It was not reasonable to expect, therefore, that they could have had so large an attendance in the show-yard; but those who had passed up and down to Canterbury would be of opinion that it was a very proper district to visit (Hear, hear); for they had seen both along the track of the South-Eastern and the North Kent lines lands in various degrees of cultivation, which afforded clear demonstration that the agriculturists of those parts required to be routed up a little by the criticism of observers from a distance (Hear, hear). With regard to the importance of the district, he need only allude to the immense sums which were now being expended under the authority of Parliament to promote railway accommodation therein. Since the meeting of the Society at Canterbury the great Victoria terminus in London had been opened, by which means direct access was obtained from the west-end with the south-eastern portions of the country. And not only that, but Parliament had sanctioned the extension of the Kentish railways across the river Thames at Blackfriars to a point near Smithfield, at an expense of upwards of a million sterling. These were matters which indicated the importance of the district, not merely with respect to the continental traffic, but also the local traffic, and would

serve to show that whenever the cycle again came round for the Society to repeat its visit to that part of the country, very great accommodation in the means of transit would have been provided (Hear, hear). He should be wrong were he not to mention the great assistance the Society had received personally from the mayor and the local committee of Canterbury, who, he must say, were extremely anxious to do everything in their power, worked with extraordinary zeal, and gave hearty and efficient co-operation in carrying out the arrangements for the show (Hear). The next meeting, for the year 1861, would be held at Leeds, where, owing to the enormous population, they might expect a large number of visitors to the yards, and very considerable pecuniary returns (Cheers). The local committee had taken up the matter with great energy. They were determined to provide a very handsome prize list for the local breeds, as well as to supply a large tract of land for practically testing the various implements. The inhabitants of the West Riding, being familiar with the machinery which was employed to such an extent in their manufactures, had consequently very great taste for mechanics, and the committee were extremely desirous that the mechanical portion of the forthcoming show should be developed to the utmost degree. They stated that that was a portion of the show which was sure to attract great attention, and prove vastly interesting to the people of the West Riding. In order, therefore, to afford the greatest amount of accommodation for the immense numbers whom they might expect to attract to the yard, it had been arranged that on the Monday the implement yard should be opened at 5s. each person, and that as soon as the judges had completed their duties, the cattle yard should be thrown open about one or two o'clock on the same day without any additional charge. On Tuesday, Leeds market-day, and on Wednesday, it was intended to open both yards at 2s. 6d.; and Thursday and Friday would be 1s. days. Thus it was hoped that all classes would be accommodated (Hear, hear).

The SECRETARY (Mr. H. Hall Dare) then read the following:—

REPORT OF THE COUNCIL.

The Council have to report that the Society consists at the present time of

85 Life Governors,
95 Annual "
1,093 Life Members,
3,651 Annual " and
18 Honorary "

making a total of 4,942 names on the list.

The members of the Society will have shared with the Council their sense of the great loss they have sustained by the decease of the Duke of Richmond, one of the trustees of the Society, and will long cherish the memory of one who had filled three times the office of President, and always evinced a warm interest in the affairs of the Society.

The Council have elected the Duke of Marlborough to fill the vacancy among the trustees, and Mr. Owen Wallis, of Overstone Grange, Northampton, to supply the vacancy among the general members of the Council, created by the resignation of Lord Southampton.

The statement of accounts for the half-year ending 30th June, 1860, has been approved by Messrs. Quilter, Ball, and Co., public accountants.

The funded capital consists of £12,000 stock; and it is hoped that a large portion of the arrears of subscription, amounting to £1,472, will be shortly paid up. It is found that many members cease to pay their subscriptions under the impression that in this way they can terminate their membership; but the Council desire to remind them that by the bye laws all members are bound to pay their annual subscription until they shall withdraw from the Society by a notice in writing to the Secretary.

Every claim against the Society has been discharged, a complete system has been introduced into the accounts, and the Council feel confident in stating that the finances are in a favourable condition. It has been decided that a complete list of the members shall be published in 1861.

Since the last general meeting, Professor Voelcker has delivered a lecture on oilcake, pointing out the composition and feeding value of different descriptions, and the means usually adopted for adulteration.

The country Meeting at Canterbury, though instructive in the varied character of the implements displayed and the nature of the live stock exhibited, did not prove successful in a financial point of view, and has entailed a considerable charge on the general funds of the Society.

The Council have to acknowledge the hospitable reception accorded to them at Canterbury by the mayor, as well as the valuable and zealous assistance afforded by the mayor and corporation, and also by the local committee, in carrying out all necessary arrangements.

The Council have settled the live stock and implement prize sheets for the country Meeting, to be held next year at Leeds, and in addition to the usual prizes, classes have been introduced for Sussex cattle and Cleveland horses. The trial of implements in 1861, according to the quadrennial system in force, will comprise drills, manure distributors, horse hoes, hay machines, mowing machines, reaping machines, horse rakes, carts, and waggons. Prizes, amounting to £200, will be offered for the best application of steam power to the cultivation of the soil.

The Council have fixed that the Leeds Meeting shall take place in the week commencing Monday, July 15th. The Implement-yard will be open on Monday morning, on the payment of 5s.; and the Cattle-yard will be opened, without any additional charge, as soon after one o'clock as the Judges have concluded their labours. On Tuesday and Wednesday both yards will be open at 2s. 6d.: on Thursday and Friday at 1s. This arrangement will afford the necessary facilities to all classes of that populous district.

The Society have, from time to time, been favoured, by order of the Secretary of State for Foreign Affairs, with copies of despatches received by her Majesty's Government relating to the agriculture of Denmark, which will appear in the forthcoming number of the Journal, and with others drawing the attention of the Council to the cattle disease, and to a plan for economising seed corn.

By Order of the Council,
H. HALL DARE,
Secretary.

Mr. S. SIDNEY, on rising to move the adoption of the report, said he would take that opportunity of making a few remarks with regard to the proceedings and position of the society. He could assure the meeting that those remarks would not be made in a spirit of hostility towards the meeting: quite the contrary. It had always been his desire that the society should flourish; but the question was what it had done, with a list of something like 5,000 subscribers, and an income of about £10,000 a-year? The question was, not whether the society had done a great deal, but whether it might not have done a great deal more; whether, in short, the time had not arrived when they must not be content with following the precedents established in the first ten or fifteen years of the society's existence (Hear, hear). At present the operations were almost entirely confined to the great annual show and the *Journal*. As regarded those Wednesday meetings, at which agricultural papers were read and discussed, no one could deny that for want of reports of what occurred they exercised very little influence over the agricultural world. The great feature, after all, was the show. There could not be a moment's doubt that the collection of stock and implements in a new county did a great deal of good. In such a matter they must not look only to pecuniary results (Hear, hear); they might well be satisfied even with a loss, provided a favourable effect had been produced in an important

district. The time was come, however, when it became farmers to consider whether the prizes and regulations in relation to stock were the most advantageous that could be devised for the interests of agriculture (Hear, hear.) It was impossible to go into any agricultural society, or amongst the breeders of stock, without hearing a great deal about the over-fatness of animals exhibited at the show. This evil was increasing, and though it might be difficult to carry out the attempts which were commenced at Gloucester, that was no reason why, if the society believed in the existence of the evil, it should not take some steps to arrest it. The fact was, that at present animals, and especially female cattle, were brought forward and fattened to such an extent, that every year a considerable number of valuable breeding animals were destroyed simply for the purpose of producing a good effect at the agricultural show. He did not say that merely on his own authority; they had only to go among the breeders of Shorthorns to hear it constantly asserted that both males and females were destroyed by this over-fattening. He did not, he confessed, see his way clearly to what they were to do with respect to male animals; but he would recommend that care should be taken to ascertain whether the females who carried off the prizes were prolific, and that the results of the investigation should appear in the Society's *Journal*. They would then know, from time to time, how many of the animals that gained prizes as breeding animals were only turned into fattening animals. The extent to which this practice had been carried was illustrated by the fact that some of the great prize winners had adopted the plan of giving their stock, previous to their admission into the exhibition, an unlimited supply of London porter (laughter.) If animals were fed not only on milk, but London porter, when they were sold for breeding purposes in other countries, they would certainly bring discredit on England (Hear, hear.) The same remark was applicable, to some extent, to sheep. He had lately been engaged in studying the useful, though not very genteel, animal called the pig. The prize-sheet of the society included a prize for sows from three to eight months old, the prize being awarded about June. He had received letters from many leading pig dealers in Yorkshire and Devonshire, pointing out that in order to gain a prize, those pigs must be farrowed at Christmas, a period of the year when the practical breeder did not wish to see them farrowed (Hear, hear.) Another point to which he wished to call attention was, that the society was established not only for the encouragement and extension of what was successful, but also for the improvement of agriculture in those parts of the country where it was in a backward condition (Hear, hear.) It must have struck any one who had been in the habit of attending the society's shows, that while they saw brilliant displays of the standard breeds stock, the others were almost overlooked; that when they moved out of the favoured circle, when they left the best cultivated districts, and went into the mountainous ones, and especially Wales, they found the land fed over by a very inferior description of stock. Now, he would submit for the consideration of the Council, whether a more effectual step might not be taken than that of offering a prize, for calling the attention of the landowners of Wales to this subject, with the view of leading them to introduce on their hills a better description of cattle and sheep. They were told that the Cheviots had been successfully introduced on the Welsh hills; but they knew that nothing could be more wretched than the general run of Welsh sheep. Of late the excellent qualities of the Ex-

moor sheep for mountainous districts had been recognised. Valuable as were the qualities of the four standard breeds of sheep, they were not fitted for the bleak hills of Wales nor for any mountainous district. Another important question was that of the housing of the farm labourer. He had imagined that that was not quite within the scope of the Society's operations; but on turning to the statement of its objects, printed in 1840, he found mention made of the amelioration of the condition of the English labourer. He thought that if nothing else could be done, most valuable statistics might be collected by the Society, with a view to the improvement of the dwellings of labourers. That would form an important part of the agricultural survey, the importance of which he had pressed on the attention of the Council. The Society had now been in existence for 26 years, and it was desirable that it should take stock, as it were, of the progress which had been made in agricultural science. With respect to implements, he thought it would be well to increase in many cases the amount of the prizes, to abandon the various systems of treating the trials as races, and to adopt effectual means of letting farmers know what implements were most likely to be of service to them (Hear, hear). Wherever farmers congregated, he heard it remarked, in effect, that the Society had placed itself in a false position in relation to steam cultivation. He had no wish to defend Mr. Smith's intemperate language; but he could not help remarking, that his system of steam cultivation, though adopted by 100 practical farmers, was first rejected, and afterwards practically ignored by the Council (Hear, hear). He was happy to hear that the Implement Committee had received an accession of some gentlemen of a highly practical character, and he trusted that one result of that would be the issuing of reports containing full and useful information with regard to the more important implements. He could not help observing with regard to the reapers, that in consequence of the conditions under which they contended having varied, in consequence of their having been tried at different periods of the year, and sometimes upon wheat, sometimes upon rye, and sometimes upon some other crops, no less than five different reapers had received the prize, and it was almost impossible for any man who was not in the secrets of the Council to tell what particular reaper would suit him best (Hear, hear). He had made these observations solely from a desire to aid the Society in the promotion of its work, and trusting that they would be received in the same spirit, he now moved the adoption of the report.

Mr. LANGSTON, M.P., having seconded the motion; it was put from the chair, and carried unanimously.

The Secretary then read the following balance sheet:—

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

HALF-YEARLY CASH ACCOUNT, FROM 1ST JANUARY TO 30TH JUNE, 1860.

Dr.						
To Balance in hand, 1st January, 1860 :	£.	s.	d.	£.	s.	d.
Bankers	1339	8	0			
Secretary		3	4	4		
					1342	12 4
To Income, viz.:						
Dividend on Stock				146	17	6
Subscriptions:	£.	s.	d.			
Governors' Annual	620	0	0			
Members' Annual	3276	6	0			
Members' Life-Compo- sitions	170	0	0			
					4066	6 0
Journal:						
Sales	122	9	8			
Advertisements	39	10	9			
					162	0 5

Country Meetings :

Chester	1	0	0
Warwick.....	11	16	0
Dividend from estate of late Secretary	970	11	10

Sale of Sundries.....	983	7	10
	46	4	0
	5404	15	9

To Canterbury Meeting, July, 1860 :

Amount received on this account.....	2624	1	0
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£9371 9 1

CR.

By Expenditure :

Establishment, including Rent, Taxes, and Salaries	583	0	5
Postage and Carriage.....	30	5	2
Journal :			
Printing	415	10	6
Literature	181	0	6
Stitching.....	60	6	2
Delivery, Advertising, &c.....	141	12	11

798 10 1

Chemical Grant	325	0	0
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Veterinary Grant	200	0	0
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Advertisements.....	7	19	0
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Warwick Meeting Arrears.....	40	0	0
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Testimonial to B. T. Brandreth			
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Gibbs, Esq., Honorary Secretary	19	0	6
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Sundries.....	3	13	11
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Subscription returned.....	1	0	0
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2008 9 1

By Investment :

£2000 New 3 per Cents	1875	0	0
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By Country Meetings :

Paid on account—			
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Canterbury, 1860.....	1827	16	2
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Leeds, 1861	0	2	0
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1827 18 2

By Balance in hand :

Bankers	3647	6	10
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Secretary	12	15	0
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3660 1 10

£9371 9 1

(Signed) A. N. HOOD, for Finance Committee.

QUILTER, BALL, JAY, & Co., Accountants.

Examined, audited, and found correct, this 7th day

of December, 1861.

(Signed) WILLIAM ASTBURY, } Auditors on the part

HENRY CORBET, } of the Society.

BALANCE-SHEET, 30TH JUNE, 1860.

LIABILITIES.

To Capital :	£.	s.	d.	£.	s.	d.
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Surplus, 1st January, 1860	13264	6	11			
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Surplus of Income over the Expenditure during the Half-year, viz :						
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£.	s.	d.				
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Income	5404	15	9			
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Expenditure.....	2008	9	1			
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3396 0 8

16660 13 7

To Balance at Credit of Canterbury Exhibition, 1860.	795	2	10			
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£17456 16 5

ASSETS.

By Cash in hand	£.	s.	d.	£.	s.	d.
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By New 3 per Cent. Stock £12,000, cost.....	11796	14	7			
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By Books and Furniture, Society's House, Hanover Square	2000	0	0			
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MEM.—The above Assets are exclusive of the amount recoverable in respect of Subscriptions in arrear 30th June, 1860, which at that date amounted to £3697.						
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£17456 16 5

Mr. ARKELL in moving a vote of thanks to the auditors, said, while he was feeling sensible of the services which it had rendered to agriculture, he agreed with Mr. Sidney that the Society ought not to rest on its oars. All societies were too apt to relax their efforts after they had met with partial success, and hence the importance of occasionally infusing a little fresh blood (Hear, hear). Young men were generally more energetic than old ones (laughter); and while they took care to have sufficient ballast in the Council, they should also aim at securing increased vitality (Hear, hear).

The motion having been seconded, was put and carried.

Mr. ASTBURY returned thanks for himself and his brother auditor.

On the motion of Mr. Raymond Barker, seconded by Mr. Owen Wallis, Messrs. Astbury and Corbet were re-elected auditors, and Mr. Cohen, formerly head clerk in the Society's establishment, was chosen to fill the vacancy occasioned by the elevation of Mr. S. Druce to a seat in the Council.

Mr. ROCHFORD CLARKE then called attention to the subject of improving the house drainage in towns, and applying the sewage matter to the fertilization of the land. He referred in terms of approval to the exertions which are being made by the Emperor of the French in this respect, and instanced with satisfaction the success which had attended the measures adopted at the fortress of Vincennes, at Bordeaux, and Toulouse. Whilst at the latter place, he observed, the Mayor, M. Courtois, told him that there was then a lady in that city, living in great style, who had made her fortune entirely by the collection and sale of this description of material (laughter). Mr. Clarke concluded his observations by handing the chairman a copy of a pamphlet, of which he was the author, on the "Reform of the Sewers" and the "Rescue of the Rivers."

LORD BERNERS then proposed a vote of thanks to the Earl of Powis for presiding, and in doing so alluded to the subject of Mr. Clarke's pamphlet. He added that he could bear personal testimony to the value of nightsoil in its application to all crops, and more especially to clover and sainfoin.

Mr. S. JONAS seconded the motion, which was assented to by the meeting with loud acclamations.

The CHAIRMAN said, I beg to thank you for the compliment you have been pleased to pay me. I am glad to find from the observations which have been made to-day that there is a general concurrence with regard to the objects of the Society, though differences of opinion may exist as to the particular mode or degree in which some of those objects should be pursued. With respect to the encouragement of local breeds, or the assistance of farmers in remote districts in improving the local breeds, I must say I think the ordinary arrangements of the Society provide for that in a satisfactory manner. Every year we give general prizes for the established breeds of sheep—the Leicesters and the Southdowns; and, I am happy to say, now also for the Shropshire Downs: while, as regards cattle, we give prizes for the established breeds—for example, the Shorthorns and Herefords—which are to be found all over the country. But, at the same time, local breeds are not neglected; for while taking care that nothing is done which would clash with the rules of the Society, we give men in different localities an opportunity of gaining prizes for the classes of animals in which they were especially interested. I may allude, by way of illustration, to the large class of Romney sheep exhibited at Canterbury. That is a class of sheep of considerable bulk; and, although not models of beauty, like the sheep of Lord Walsingham or of Mr. Jonas Webb, yet perhaps owing to the nature of the land on which they are found—a peculiar marsh district—they are more useful there than other sheep would be, because they suffer less than others would do from rot. I think that when we discover large local breeds, we may fairly consider that there are some local reasons of soil or climate which make them particularly suitable to that particular district (Hear, hear). With respect to the observations as to the need of improvement among the sheep of Wales, and the introduction of Cheviots, let me remind those who were at the Shrewsbury

meeting, some years ago, that the prize for mountain sheep was not won by sheep from the north, but by some from the late Lord Bagot's farm, in Devonshire (Hear, hear). I may add that Colonel Douglas Pennant has found that the Cheviots, though they do well on dry hilly ground, are not adapted for wet land. As a Welshman, I can inform you that not only is there a larger amount of rainfall in Wales than in England, but that on the sides, and in the vicinity of many of the hills, there is a peaty boggy soil, which it is almost impossible to traverse on horseback; and such places require a very different kind of animals from those of the drier mountains and downs of England. In speaking of Welsh sheep, I may claim credit for the establishment of a great breed in a part of this country which was formerly under the jurisdiction of the lords of the marches of Wales. I refer to Hereford and Shropshire, where within the last 20 years the breed of Shropshire sheep has advanced rapidly towards perfection, and increased numerically to a surprising extent. That is a breed which you will find prevailing among the valleys of the borders of Wales, such as the Vale of the Severn. At the same time, I think that in bulk the mountain sheep are gradually increasing, by intermixture with other breeds, and advancing as far as the wet nature of the soil and climate will allow. With respect to the amelioration of the condition of the labourer, I must say that I think this society has, both directly and indirectly, done a great deal already. The improvement of agriculture itself is improving the condition of the labourer. (Hear, hear). I may appeal to your own practical experiences whether all of you do not employ more labourers than your predecessors or fathers did twenty years ago. (Hear, hear). I may appeal to you also whether the rate of wages for agricultural labourers has not increased during the same period (Hear, hear); and these two cases, combined with the improved machinery which makes it your interest to cultivate quickness and intelligence in individual labourers, are perhaps doing the work of amelioration more soundly, and securely, as well as more rapidly, than any parliamentary legislation could do it. (Hear, hear). In the next year the Leeds local committee, devoting special attention to the improvement of the dwellings of labourers and artisans, will give prizes for the best pair of agricultural cottages that shall be exhibited complete for a cost not exceeding £180. (Hear, hear). They also propose to give prizes for plans for blocks of dwellings suitable for artisans and persons paying a rent of from six to eight pounds a-year. By that means they intend to draw attention to the improvement both of agricultural cottages and of small urban dwellings for the working-classes. As regards parliamentary arrangements for the improvement of cottages, I may remind you that Acts have been passed from time to time, during the last few years, to enable persons having limited interests in land to charge their estates with permanent improvements, and that in these Acts not only farm-buildings, but cottages are included, always with the proper restriction that the cottages must be proved to be necessary for the cultivation of the farm or the estate; so that in that way considerable progress has been made in gradually improving cottages and creating a better class of dwellings for labourers. I think I may also say that great improvement has been made in regard to old cottages. A great many of these are encroachments on the waste, run up with timber at a time perhaps when brick and stone were not to be procured, and often with timber of an inferior sort. These cottages

are generally built on leases for a certain number of lives or a term of years. When the leases fall in, the cottages come back to the estate perhaps nearly worn-out, and with a considerable population attracted by them, and of course it is a matter of time and cost to put them into what would be called tenable condition. They are often too numerous to be pulled down and rebuilt, while at the same time they are in such a state that it is not an easy matter to repair them. I think I may say, however, that in almost all districts that is gradually being superseded by slate and tiles, and that mud walls are everywhere giving place to bricks or stone. This is itself, as regards the warmth and comfort of cottages, a very great step in advance. Of course, wherever, through the introduction of railways, materials are cheapened, and cottages made to yield something like a return for the money expended on them, the natural consequence will be that owners of land will be able with ease to themselves to build a larger number of cottages. Moreover, if a pressure for cottages now be felt in many districts, I must remind you that that is owing not merely to the increased number of labourers employed, but to the circumstance that, in consequence of the progress of society and the gradual elevation of farmers, there is a growing disinclination to have farm-servants living under the farmer's own roof. This change has thrown an additional burden on the owners of land, with regard to cottages, and it ought to be taken into consideration. As regards the obtaining a survey of agriculture throughout the country, I am inclined to think that that object will be best attained by the Society visiting, as it does, a new district every year. With respect to the giving of great rather than small prizes, I am of opinion that we should give such prizes as will be likely to secure implements adapted for the purposes not merely of the large farmer, but also of the farmer whose holding is too small to justify a great outlay. In reference to the last year's prize of 100*l.* for the best steam plough, I may remark that the Leeds Local Committee considered that it would be more advantageous to agriculture for them to expend their money in providing a large tract of ground for a continuous and effective trial of steam ploughs, than to devote it to a prize of large amount. In that opinion the Implement Committee and the Council of this Society entirely concurred; and the Leeds Committee have undertaken to provide at least 100 acres of land for the trial (Hear, hear). Let me add, with regard to our subscriptions, that three circulars have been sent out this year, and that if any gentleman will be good enough to assist the Secretary in collecting arrears, the Council will feel very thankful to him. I am very much obliged to the learned gentleman (Mr. R. Clarke) who has addressed us in relation to sewage—a subject the importance of which can, whether in or out of Parliament, scarcely be overated. I am glad to see that a company has been established during this year for the purpose of testing this sewage question practically, by ascertaining whether or not sewage can be made remunerative in the neighbourhood of Croydon, which, I need scarcely say, is very accessible, and therefore well adapted for such an experiment. At the same time I may remark that on that subject, as well as other topics connected with engineering, we have seen controversies in the newspapers between different engineers, and as strong evidence for and against the scheme proposed as ever was given before a parliamentary committee with regard to two disputed lines of railways (Laughter). The question is one for careful enquiry; and whatever may be the result, a considerable

time must, I think, elapse before any plan can be matured which would be generally available in the neighbourhood of all our populous towns (Hear, hear). These and kindred topics are subjects which must be developed not simply by the corporate action of the Society, but by being taken in hand in different neighbourhoods by persons residing there, and by different classes of the members of this society applying their abilities to the solution of those particular

questions with which their own calling or education may have rendered them familiar. I fear I have trespassed too much upon your time, but I could not refrain from making some allusion to the various topics which had been brought before us (cheers). In conclusion, I again thank you for the compliment you have paid me (renewed cheers).

The meeting then separated.

THE SMITHFIELD SHOW WEEK.

The proceedings of this busy week were more of promise for the future than of any actual excellence in the present. The show itself was clearly not a great one, but almost everything connected with it "went well." As with its immediate predecessor at Birmingham, the many difficulties of the season have had their effect, and the display in Baker Street cannot fairly be recorded as up to the average of late years. Some of the best judges and breeders of stock doubted if there was really a Gold Medal animal in the yard; and the Leicesters and Pigs furnished "the prime pieces" for the butcher. A consecutive analysis, however, of the several classes will be found elsewhere; while we may be pardoned for adding here how directly the opinions maintained in our report of the Midland Counties Meeting were confirmed. As we then wrote: "We cannot think that either of the Gold Medal animals of the week past will be the object of any such similar attraction in the present—" and they were not. Again, "As a lot, the one class of Hereford cows was the best of the show. There was Mr. Pitt's deep broad one, Mr. Tudge's neater and prettier, and another very handsome one of Mr. Hill's to separate them. The first-prize has not the style of either of the other two, and another set of judges would be very likely to take another new reading over these three Graces." This has been proved to the letter. It was from the best class at Birmingham that the Smithfield Club selected their Gold Medal cow, but transposing, as we said they would, the three they had to choose from. There were other differences of opinion amongst the two sets of cattle judges; but, on the whole, the new trial granted was considered to be the more satisfactory of the two. Majesty, as we also intimated, gave its countenance to the occasion, and Mr. Brandreth Gibbs, with all his recent experience, has become a very courtier in the grace of his receptions.

Under the sunshine of such patronage the business of the Club prospered. Seldom is it that better resolves have been taken. Lord Berners, as everyone expected, was chosen as the new President, but only for one year, despite the endeavour of another noble lord to make it a triennial appointment. Then there is to be, what in such a state of transition is especially needed, another general meeting of the members of the Club in May; to be held on the same day as the half-yearly meeting of the Royal Agricultural Society.

Further, Mr. Thurnall's motion for clearly defining the breeding of any "cross" entered was carried; and the shares in the new Hall of the Club were selling. The only "damper" was the dinner, in itself a most indifferent one, most indifferently attended. There were not sixty people present; but the speaking went to contradict the actor's axiom that men cannot play "up" to a thin house. Almost every address delivered had its practical value, and Mr. Eaton came famously at the finish with an interesting account of his struggles and successes as a Cape farmer.

At the companion Club in Bridge Street there is a yet greater ambition for oratorical effect, pushed as this was a little too far on the Monday evening. Mr. Scott Burn gave parts only of a very carefully considered and most comprehensive paper "On the Condition of the Labourer," that will read even better. We publish the essay, for such it really is, in full. The subsequent discussion was not, on the whole, worthy of the opening, degenerating, as it did eventually, into unseemly noise and confusion. The best friends of the Club will have to look more resolutely to this growing evil, or one or two well-known offenders will do irreparable injury to the character of the discussions—after all, the great strength of the society. The dinner of the same Club went far more evenly. It was well attended, well "done," and well spoken to. According to present proof, it is very fortunate, that the suggestion for holding the two dinners the same day was thought better of.

Foremost amongst many other encouraging auspices is the progress of the Royal Agricultural Society, which is really now developing as it should do. Never yet were there such liberal, well-arranged prize-lists as both those for stock and implements at the approaching Leeds Meeting. The trials of the former are to be considerably extended, and the steam-cultivators, in accordance with another meeting of the Implement Committee held on the Friday, will be put to work in April, with some three hundred acres of land to practise upon. This additional opportunity has been afforded mainly at the instance of Mr. Fowler, who suggested as much at the General Meeting on the Wednesday. Here Mr. Sidney, readily adopting our own phrase, "made his usual speech," the tone of which was very moderate, and his "point" the absurd abuses arising from over-feeding show stock. Hence, as we now see, come many of the robberies in practice at

the Shorthorn sales, and the barren beasts palmed off to establish the breed in other countries! But Mr. Sidney, declaiming against over-feeding in Hanover Square, is in much the same position as Mr. Barford in Baker Street, protesting against a still more apparent iniquity, in clipping and trimming sheep into shape. The veriest "outsider" by this knows how true are such charges, and how common such practices; but directors and committee-men, in council assembled, will have nothing to do with them, simply, we are afraid, from having already had far too much to do with such "goings on." It is thus that men like Mr. Sidney may do good.

"The River Reform" meeting, as Mr. Algernon Clarke has christened it, was tolerably well attended, and especially benefited by the services of a capital chairman in Lord Romney, and as efficient a secretary in Sir Henry Vavasour. Sir John Shelley, too, with his practical experience of "the House," offered some opportune advice as to how the movement should be managed. The conference resulted in the appointment of a committee, which met on the Saturday, and determined to see the Home Secretary, with the intention of asking the Government to bring in a comprehensive measure on the subject. Some half-a-dozen names or so were, in the first instance, offered to the meeting as the constituents of this committee, from which the name of Mr. Algernon Clarke, who has written more and is, practically, better acquainted with the subject than anyone now alive, was carefully left out; and the whole thing began to look like "a job" for puffing some "distinguished person-

age," who would seem, however, to be very well able to do this for himself. Of course somebody rose at once to add the name so curiously omitted, and a few others were subsequently let in; but there is a too palpable egotism and absurd assumption of authority exercised in a certain quarter, that will have to be continually resisted. Nothing so injures a movement like this as anyone with impudence or arrogance enough, being allowed to make a trade out of our common cause; and the endeavour does not start so warmly as to suffer from being "over-laid" in this way. There is no doubt but that the Government might easily carry a Bill in the ensuing session, combining the features of that of Lord Carlisle's introduced in 1852, with Mr. Ker Seymour's, of 1854. Such a measure would meet the immediate wants of would-be-drained estates as well as enable the majority of proprietors in a district anxious for improvement, to compel the minority to assist. At the same time, it is essential that a Government inquiry should be made into the present state and management of our rivers, and the general drainage of the kingdom. A companion investigation might be entered on over the manifold deficiencies in existing Acts of Parliament, with a view to the framing of some future enactment to improve the drainage of the country, and to deal with mills, water-rights, and other "vested interests," without the burden of local bills.

Our own *special* Reports of all the meetings referred to will be found in our pages; together with a careful estimate of the Show, our own Prize-lists, and other information of an exclusive character.

SMITHFIELD CLUB CATTLE AND IMPLEMENT SHOW.

For some weeks past large placards have been visible in the metropolis advertising all whom it may concern of the approaching cattle show. On the Monday many omnibus proprietors hoisted the flag of the Durham ox, and their vehicles sailed up Oxford-street under its significant and well-understood colours, while cabbies kept a bright and early look-out at the terminus or in the street for any customer who might confirm their traditional notions of that class of portly gentlemen usually known as *rus in urbe*.

It is well that the proposition of John Duke of Bedford, made in 1821, was not agreed to by the members of the club. That nobleman urged the breaking-up of the club because "the markets of the metropolis and throughout the kingdom are abundantly supplied, the best and more profitable breeds of cattle and sheep have been brought into notice, and have made rapid and extraordinary progress in the estimation of the breeder and grazier." The Duke, in conformity with this opinion—that the ends for which the club was associated were answered—withdrew his name from the subscription list. The withdrawal of such liberal support and so distinguished a presidency had the effect of arousing the energy

of those members who remained, and who, in opposition to the great Duke, cherished the conviction that the ends of the club were much more extensive than he imagined, and, so long as there remained cattle to improve, and farmers to improve them, never would be accomplished. The success of the club under the enlightened presidency of Earl Spencer and the Duke of Richmond, and the clever secretarial management of Mr. Brandreth Gibbs and his brother, whom he succeeded, shows clearly enough that his Grace of Bedford mistook the dawn for the full daylight, and wished us to be contented with a few rare specimens of bovine excellence; whereas the real object of the society has been to make the exceptional excellence of that day the rule of ours. Some few only in the Duke's time were aroused to the importance of breeding, to the heritage of good qualities; whereas now every tenant-farmer knows that it costs no more to have a well-bred animal than a bad one—nay, that the first expense of obtaining the good breed is swiftly and amply repaid in its early maturity and fattening properties. Not a man now, however small his tenancy, but looks for the traits of blood, in whatever breed he may wish to select from,

and as the adaptation of breeds to districts is now pretty generally known, he is not long in suiting himself. How vast an addition such a change as this, brought about in the public mind mainly by the Smithfield Club, has made to the wealth of the country, cannot be estimated. Some glimmerings of light upon this question we do gain, however, from a comparison of certain local data. In 1792, for instance, the 76,210 head of cattle sold in Smithfield market weighed on the average 370lbs., and the 514,700 sheep 28lbs. In 1794 a great improvement occurred, for the 109,064 cattle weighed on the average 462lbs., and the 717,990 sheep 35lbs. In 1821, when the Duke of Bedford said that the objects of the club were answered, this average was considerably advanced, but the last thirty years have certainly seen a prodigious advance upon the average of '21. The principles of breeding laid down by Bakewell, and practised by the Collins and Booths, have spread far and wide, and been accepted without a demur. Science has assisted the breeder and the feeder—the first to reduce the bone and offal, and increase the meat; the latter to improve the roots, and to combine them in such a way with other alimentary material, as to clothe the rectangular frame with muscle and fat in a firm and regular manner. Whereas we had some six or seven distinguished herds, we now boast about sixty, the owners of which are not only doing all they can to support their own reputation; but are exerting a very sensible influence upon all classes of breeders. From every locality where such a herd resides proceeds a small wave of progress and stimulus, and never will the labourer of the club or the objects of the show be brought to a close until every beast bred in the United Kingdom is a gold medal animal. Such stock as the Durham Ox of a past century, and Colonel Towneley's Beauty and Beauty's Butterfly of our own time, by standing out with such marked distinctiveness, prove better than anything that the breeder's work is far from being done. That the continued exertions of the members of the club are needed, is proved by the show of this year. It seems in some classes to have fallen back, and as a whole not to be so good as many of former years. There are none of those striking forms which attract and astonish. The disappointment which those may feel who are most interested in this matter, will be materially modified however, when they consider the unparalleled difficulties that have beset the breeder and the feeder throughout the last two years. The drought of last year and the flooding rains of this may account for much. It will not excuse imperfect forms we know, but it will excuse imperfection in the fattening process. In looking round the yard we must bear in mind the spare pastures and the want of water which characterised the summer of '59, the inclement autumn which followed, the cheerless spring which succeeded upon a long variable winter, the succulent unsunned grass, and sudden lair of the past summer, and then the mouldered hay and unnourishing roots upon which they have been since "got up." Under such circumstances our view may be changed, and we may come to consider it, conditionally, a successful show. Suffice it to say, that if it is a good repre-

sentation of the state of the fat stock market generally, it does not speak hopefully for the profit of the producer, while it warns the consumer that when the turn of the year is made, he may expect to buy meat much dearer than he does at present.

Those who wish to know how the show of this year stands with respect to other years, in point of numbers, will be glad to glance at the following table:

	1855	1856	1857	1858	1859	1860
Devons	17	21	32	28	37	33
Herefords	20	21	36	26	18	17
Shorthorns	40	42	43	42	47	36
Cross breeds	7	12	65	35	17	19
Extra stock	9	12	—	14	—	14
Sussex	—	—	—	—	15	15
Norfolk	—	—	—	—	4	4
Longhorns	—	—	—	—	4	3
Scotch horned	16	13	—	—	10	11
Scotch polled					13	5
Irish ditto					1	1
Welsh ditto					9	3
Other pure breeds	3	18	—	26	—	2
	112	139	176	171	175	163

Commencing our review with the Shorthorn, it will be well to say, that out of the thirty-six animals twenty-three are exhibited by the breeders. The Shorthorn men are, in this case, represented by the Duke of Beaufort, the Earls Spencer, Radnor, Gainsborough, and Howe, and Messrs. Stratton, Langston M.P., Heneage M.P., and R. W. Baker. In the class for steers above three years old, the last-named gentleman carried off the gold medal, with a handsomely marked roan ox aged three years and eight months. This animal is perhaps most remarkable for his immense depth: in girth he measured 9 feet 4 inches: has been fed with great regularity. The spring of the rib is surprising. If a deficiency existed any where, it was in the breast-end; but he is a "grand" beast to face. Though there are those who revert with preference to Mr. Wortley's ox of '57, no one could doubt the justice of the award in this instance, or could help lingering in the neighbourhood of a form so symmetrical. The Duke of Beaufort, the object of the gold medal award at Birmingham, here obtained the first prize in the class for steers not exceeding three years; the colour, red and white, the girth 8 feet 10 inches, back very level, hips well developed, ribs springing, breast very fine, and touch specially firm. The winner of the 3rd prize in the 10th class, bred by Mr. R. Stratton, is an exceedingly good strawberry roan animal, girthing 8 f. 11 in. Beside him stands another, from the same herd, and discovering the most marked and curious inferiority. The proportions of the former are grand, but they are thrown out into such marked relief by contiguity to the latter, that one is obliged to stop and seek an explanation of the difference. The rump, thighs, and twist of the prize steer would send many a breeder home to his own yard in despair. A very perfect white steer, 2 years 10 months old, from the same herd, received a high commendation. The horns were not to our taste. Mr. Hulbert's, a white steer of great beauty, received the 2nd prize. The 3rd prize in the younger class

represented the Sarsden herd; colour white; head fine, and well set; shoulder well thrown out, chine broad, back level, hips well clothed, and touch firm. The 2nd prize steer in the elder class is also white, from the Earl of Gainsborough's herd, with level back, fine cylindrical form and mellow touch. These two classes of steers are not wonderful. There is no indication of progress.

There are four Shorthorn heifers not exceeding four years. This class was wont to be the centre of attraction. This year it contains nothing of rare merit. A universal lament is uttered. Those who saw "the milk-white Io," the Beauty's Butterfly of last Christmas, retain too clearly imprinted the vision of her fair comely form, her lovely head, graceful neck, and full bosom, to rest satisfied with anything short of her perfection. Notwithstanding this falling off, however, the white heifer which secured the 1st prize, from the herd of Mr. Heneage, M.P., was very beautiful, with a girth of 8 ft. 3 in. The 2nd prize heifer, Mr. Stratton's "Bee," of a deep red, with strikingly beautiful head, deep forequarter, highly-developed breast end, rump and thighs, bone small and fine, is in all, to our mind, the most perfect in her class. The judges certainly have far better opportunities of judging than simple visitors, and we should not say a word by way of showing any disagreement with them, especially this year, when their awards are so generally approved, were it not evident, by the reversal of the Birmingham decisions in several important cases, that judges in their fallibility are apt to differ. A strong contest, in which this heifer was successful, occurred at Birmingham. A commendation went to Mr. Champion's Ruby, a red heifer, with remarkable rump and thigh, though very inferior in touch to those already mentioned. The show of short-horned cows was respectable. Col. Pennant's "Ada," was first, the Earl of Radnor's "Bomarsund" second, and Earl Howe's third. "Ada" was first at Birmingham, a level broad white cow, of great and symmetrical proportions.

Of the Herefords we have to report a fair show. Of the young steers there was but one, but of so unmistakably good a character, that although without a competitor, no difficulty was felt about the award of the prize to Mr. Bettridge; Mr. Tudge, the breeder, receiving the medal. The quality of the 2nd class much surpassed that of the same at Bingley Hall. The 1st, 2nd, and 3rd prizes went to Messrs. Lewes Lloyd, George Garne, and W. Aldworth, respectively; while Mr. Towers', which won the 2nd prize at Birmingham, got only a high commendation. Mr. Lloyd's was very beautifully fed, presenting a level surface, bone fine, head neat, horn waxy. Mr. Stoke's and the Prince Consort's were both very large, but not so well fed as the generality. Mr. Garne's girthed 8 ft. 6 in., and Mr. Towers' 8 ft. 9 in. A pretty little heifer took the prize in the next class, in which there were only two entries. The Gold Medal for the cows lodged with Mr. R. Hill's Lady Ash, aged 5 years and 2 months. She has had two calves. This handsome cow stood 2nd at Birmingham. The cow that won the 1st prize at Birmingham ranks 3rd here; while that which was only highly commended at Bingley Hall, received at Baker

Street the 2nd prize. This is reversal with a vengeance! We did not hear two opinions, however, about the justice of the awards this week; and though Mr. Pitt's "Countess" (1st at Birmingham) possesses a form of great beauty and rare development, she is so unevenly fattened and so loose in touch as to render her incapable of holding the first place.

The Devons formed a very ruddy class, much improved in quality of bone and meat. Out of the 34 representatives of the breed 19 were exhibited by their breeders. The class was large and good, and that point wherein the Devons mostly fail (the rump) was certainly better developed than formerly. Mr. Farquharson's 2nd prize steer, and his 2nd prize heifer; Mr. Walter Farthing's heifer, "Beauty," his first-prize cow, "Nelly," Mr. Bone's second-prize cow, and Mr. Dunning's steer being remarkable instances of this improvement.

His Royal Highness the Prince Consort's herd was well represented by one of the Birmingham "*Zouaves*," and the dainty-limbed "*Lovella*" highly commended. The winner of the 1st prize in the steer class was bred by Mr. Quartly and fattened by Mr. Heath. This, with the Earl of Leicester's 3rd prize, was small. The backs of both were beautifully level; horns wavy and branching, bones remarkably fine, heads graceful and well set, bodies cylindrical, offal reduced to a minimum, and touch mellow enough to send a thrill of exultation throughout the minor nervous system of a susceptible butcher. A commendation was given to Mr. Dunning's steer, but no animal of the class was thought worthy to take the 2nd prize. Mr. Brake's ox, in the next class, from Mr. Fouracre's herd, received the 3rd prize, and was very remarkable for its great size. Mr. Heath's, the 1st prize, excited great admiration in consequence of its fine thighs and twist, and the fineness of its bone. Notwithstanding the firm manner in which it handled, we thought it fed somewhat unevenly. Mr. Farquharson's 2nd prize ox presented a remarkably beautiful head, and picturesquely twisting horns, a clear deep red skin, springy touch, good rump and thighs, and back perfectly level. Mr. Robert Farthing's had a low back, but splendid thighs. Mr. Mogriddle's 1st prize heifer showed very good breeding, though we considered her inferior to the Prince Consort's in set of shoulder and breadth of chine. Her form was specially compact, her back surprisingly level, and her touch firm and mellow. The wide-spread and well-covered hips of Mr. W. Farthing's heifer, the level back, and springy rib and bold-set shoulder were points specially noticeable, and we were forced to give more than one glance at that pretty, perfect little animal exhibited by Mr. H. H. Ball, of Taunton.

Amongst the cows the breast-end, rump, thighs, chine, and fine bone of Mr. W. Farthing's, and the thorough-bred appearance of Mr. Bone's, struck us as the points specially deserving notice, though we cannot speak in too high terms of the whole class.

There were 11 Sussex steers and 4 heifers or cows. The 1st prize in the former class—Mr. Coote's animal—showed a good level back, a defective rump, and great

evenness of feeding. The 2nd prize, Mr. F. Tupper's, was a fine ox, but handled loose. Mr. Pennington's first prize heifer displayed a level back and exceedingly good rump, great fineness of bone, a beautiful head, and less horn than is general to the breed. Lord Leconfield's second prize heifer possesses surprisingly good thighs, but the rump was somewhat too much thrown up and deformed. The breed does not contrast favourably with the Shorthorns and Herefords, and certainly we were not the only spectators who wondered why it is perpetuated. Mr. Cooke, of Livermere, received the prize for the only Norfolk polled steer—a fleshy, somewhat flat-sided red animal, with good touch. In the next class the same exhibitor was successful with a white heifer, with a rather hollow back. Mr. Ellis, of Guildford, took the next prize for a very small heifer. There were two long-horned steers, which we took to be very good samples of a very profitless breed. Both animals, the first belonging to Mr. Cox, of Derby, the second to Mr. Chapman, of Nuneaton, received first and second prizes respectively. They dowed their huge horns with clumsy respect to the aristocratic members of the Shorthorn steer class on the other side of the rails, and with their neighbouring cow, a prize animal of the next class, the property of Mr. Burberry, of Kenilworth, gave one the idea of their being descended from the mammoth dun cow of Guy Earl of Warwick, whose mighty rib, still to be seen at the Castle, gives indication of a frame not to be clothed by all the seductive influence of even Thorley or Henri.

It was quite refreshing to turn to the West Highland cattle. All lovers of the originality, the flash and fire of a mountain breed, paused, as their eyes scanned the shaggy mantle, the defiant horns, and wild eye. It was impossible to look at Mr. Heath's second prize dun steer, without being lost for a time to the vexatious jostling of butchers' greasy men. The mountain breeze in fancy fanned the cheek, the foot trampled the springy heather underneath, and the rugged form before us, with coat all palpitating with the morning dew, assumed its native dignity, and bellowed forth its challenge to the leader of the advancing herd upon the echoing air. It is reported that the Royal Ladies of England and France spent more time in this class than in all the others. The Duke of Beaufort's, who took the first prize, was also a dun shaggy fellow, girthing 8 feet 2½ inches, with fine springy shoulders, and wonderful quality. The greatest attention, and the seduction of cake and barley-meal have not rendered her submissive to familiarity, as our ribs can testify! Mr. Rainforth's highly commended steer was of a black colour, having a girth of 8 feet 3½ inches, and a fine springy touch. Lady Brinckman's was commended. The Duke of Beaufort and Viscount Hill took the first and second prize respectively, in the heifer class. Mr. Martin's heifer was a pretty impudent creature. They were all well-fed. The four black polled steers of the Scotch breed showed the taming influences of an unctuous oilcake diet. Mr. Wm. Heath and Mr. Wm. McCombie were the prize men. Their steers were square weighty beasts of good quality, and Mr. Martin's prize polled heifer,

bred by Mr. McWilliam, of Boquharm, well sustained by the stability and compactness of her form the character of the breed.

A little Kerry cow, the property of Mr. Oliver of Northampton, stood alone in the Irish classes.

For Welsh runts the Hon. Colonel Pennant took the first prize for an exceedingly beautiful animal, sleek of skin and fine of bone; and Mr. F. Neale, of Pagham, the second, for one almost equally good.

We come now to as interesting a class as any in the yard, the cross or mixed breed, in which the spectator observes the results of many curious experiments. So far as the consumption of the country depends, it is to this mixed breed that we have at present to look, and it becomes, therefore, a matter of interest to observe which crosses appear to produce the most profit. It seems to be a recognized fact that a cross-bred animal develops earlier and fattens sooner than a pure-bred one, but that it is not capable of attaining to the same weight as a member of the pure breed, should the period of fattening be extended. In the steer class, the first and second prizes are taken by Mr. Cartwright and Mr. Martin. The first is the result of a cross between a Polled Angus and a Shorthorn. It has the contour of a Scot, with the depth in fore-quarter of the Shorthorn; colour, black. The mixture of the Aberdeen with the Shorthorn affords in Mr. Martin's red and white steer a compact and square form, to which good feeding has imparted a springy touch. The Norfolk and Shorthorn cross is exemplified in Mr. Beare's 2nd prize steer—a square heavy beast, with splendid hindquarters. Of the union of the Shorthorn and Hereford Mr. Baker's splendid steer furnished a better example than we have ever seen. His girth was 9 feet 2 inches. His hips were thrown wide apart; his rump and twist were astonishing; his shoulders were well set, breast capacious, and his great frame well and evenly covered. He did not retain the Hereford head, and had roan markings. We observed specimens of the same union in Mr. Tombs' and Mr. Martin's heifers—the former being of exceedingly good form and of a white colour, and the latter rather small. The cross between the Shorthorn and West Highland cattle was shown to result in a roan bullock with level back and a rather saucy-looking head, not quite accommodated to the proprieties of civilization. This was Mr. J. Beasley's steer. In Mr. Ainslie's steer the cross between the Aberdeen and Shorthorn gives rise to an animal of large proportions, with fine springing shoulders, great depth, unlevel back, deformed rump, and defective thighs—colour red. Connoisseurs in fruit affirm that there is a certain hour, or two hours, during which every pear or apple we pluck arrives at its full perfection and flavour. Those who would enjoy it most must watch their time, never being too impatient or too dilatory. It seemed to us that Mr. Gibbs' heifer had just arrived at this luscious state of perfect ripeness. There was not an animal in the whole yard that gave us so much this impression; and though we have witnessed the good effects of a cross between the Alderney and Shorthorn in a very marked manner before, we never have seen

so good a specimen of its results. In colour white, with straggling red spots—a form perfect in evenness of fattening, and quality realizing all that one could desire. A cultivated German alive to the insipidity of veal, or a Frenchman escaped from the traditionary influence of frogs and made dishes, would abandon himself to a new and delicious delirium, as morsel after morsel of this dainty meat, gently pressed between the palate and the tongue, gradually dissolved away. No wonder that she was *very* highly commended. Mr. Longmore's prize (Shorthorn and Aberdeen) heifer exhibits surprising development. The cross of the Shorthorn with the Devon, shown in Mr. Ball's heifer, exhibits an animal very pretty and very small. The Shorthorn, it will be seen, is the backbone of this class, and stands in relation to other breeds of cattle very much as Leicesters do to other breeds of sheep.

In the class for Extra Stock there were 6 steers and 8 heifers—the Earl of Leicester receiving the silver medal in the first for a small but very beautiful Devon steer, and Mr. Walter Farthing for a Devon cow of remarkable quality and good breeding. Her touch and condition would never have revealed the fact of her age—yet she is nearly eleven years old, and has had seven calves.

SHEEP.

The number of entries for 1857 and 1858 was 129 in each year: last year the number was 137. At the present meeting it is only 105; but, comparing the number of animals comprised in the pens of three as well as single specimens, we find 235 at the present show, against 289 at last year's unprecedented gathering. The scarcity of sheep-food, owing to the late unfavourable seasons, sufficiently accounts for the lack of increase in a department of the Baker-street wonders, always so large and important. The Leicesters make an unmisstakeably good show both in numbers and extra quality. As wonderfully fine examples of what this breed may be brought up to, we cannot point to anything better than the gold medal wethers of Mr. Twitchell, of Wellington, Bedfordshire; their size is great, their mutton superb in the handling, wool very superior, while in beauty of countenance and fineness of offal they do credit to the breeder who has derived them from the flocks of Messrs. Sanday and Pawlett. The second prize wethers of the Hon. Col. Lowther are certainly beauties, though not so developed in frame. Mr. Foljambe's third prize wethers are splendid, as his sheep always are; but too diminutive in comparison with the winning pen. Mr. Bradshaw's are very handsome; Mr. Bowser's great, with an enormous quantity of wool. The class for Leicester wethers, not exceeding 220 lbs. live weight, is grand. Mr. Foljambe's prize pen are prime, and of wonderful quality; Mr. Bradshaw's are splendid meat; Colonel Lowther's and Mr. Twitchell's especially good; and the pen of Lord Berners very fine indeed. We admired the particularly meritorious though very small class of Cotswolds. Mr. Charles Kearsey's wethers are magnificent, large, broad, with good looks, prime meat, and a good curly fleece. Mr. West's and Mr. William Hewer's are little less com-

mendable. There is a large show of extra stock long-wool wethers. The silver medal justly goes to Mr. Foljambe's beautiful sheep; while Mr. Willmore's, Mr. Richard Newman's and Mr. Edmund Riley's well deserve their high commendations. The smaller class of extra stock long-wool ewes are also surprisingly good. Mr. Craddock, of Eastington, Northleach, takes the silver medal for a wonderful Cotswold ewe, of tremendous size, marvellous breadth of back, loin, outspringing chine, wonderful plaits, flanks, and rump, and also exceedingly beautiful in quality of meat as well as immense in weight. Such a specimen of the possible attainments of the breed has been rarely seen. Mr. Jordon's splendid Leicester ewe is deservedly very highly commended, and Mr. West's is particularly handsome.

The cross-breeds are not so numerous as before, but form extraordinary classes for their vast size and wonderful development of flesh with early maturity. The first prizes in both wether classes go to Mr. John Overman, of Burnham, Norfolk. These Down and Leicester sheep are of very great size and substance, broad, and well-proportioned, magnificent animals in every respect, and, unlike many, are tolerably fairly and evenly shorn. Mr. White's Down-and-Cotswold wethers are certainly magnificent beautiful mutton, and sufficiently broad in frame so that their trimming is moderate and fairly done. Mr. Samuel Druce's wethers are so great and good that they have merited the third prize. What occasion was there for having the backs of these sheep clipped horizontal so as to give the appearance of still greater expansion? Mr. Hine's are particularly good wethers; but here, also, we think a less amount of this shaping would have been better. Why are Mr. J. B. Twitchell's commended? They are very pretty, but the wool is clipped off their backs. In the extra stock class, Mr. Overman's Southdown-and-Leicester wether, a beautiful animal, takes the silver medal.

Among the Southdowns, we miss the Duke of Richmond's famous pens, though Mr. Kent is successful with some beautiful animals of the Goodwood flock. His prize wethers are splendid—very beautiful in every point, with especially good legs of mutton, a fine fleece, and tolerably fairly shorn. Mr. Rigden's second-prize wethers are extremely good, and fairly shorn. Lord Walsingham's third-prize wethers have extraordinary fore-quarters and good rumps; their shape being perfect in symmetry, without any special difference being observable (as in many cases) in the length of wool along the back. The pens of the Earl of Radnor and of Mr. Stewart Marjoribanks are particularly good. Mr. H. Wilson's have an amazing quantity of open wool, and are of great substance, though not very fine in quality. In the class of wethers not exceeding 200 lbs. live weight, Mr. Rigden wins the first prize for three wethers very beautiful indeed, and tolerably fairly shorn. Sir R. G. Throckmorton's second-prize sheep are fine animals, but we certainly do object to so much wool growing on the shoulders and back, and so short a staple on the loin. Mr. Kent's commended wethers, bred by the Duke of Richmond, are very excellent and

compact. In the class of two-year-old wethers, Sir R. G. Throckmorton's prize sheep have firm and splendid meat, exquisite style of head, and good fore-quarter; but we maintain that it is a gross mistake for judges to honour even the best animals which exhibit such great inequalities in the length of staple so cleverly left in the desirable places by discriminating shears. The second-prize wethers of Messrs. J. and A. Heaseman are very good indeed, and are tolerably fairly shorn. Mr. Kent's third-prize sheep have most beautiful forms, and are certainly fairly clipped. Lord Walsingham's commended wethers are very beautiful indeed, and are shorn properly. In the class for other Short-wools, the prize wethers of Mr. W. B. Canning, of Swindon, are wonderful; very broad, level, handsome, and the trimming nicely, not unfairly, done. Mr. S. King's second-prize sheep are large, and have good backs and rare rumps. Mr. W. King's third-prize pen is also very good. Mr. Walters' commended Hampshires are tremendously large, fine, handsome sheep, and fairly shorn. There is a good class of extra-stock wethers. Messrs. J. and A. Heaseman's prime wether takes the silver medal. Mr. Foljambe's is highly commended; it is a beautiful animal, but has no wool on the loin. Lord Walsingham's is open to a similar reflection. Mr. Kent's wether is very good indeed. Mr. S. King's is very great, but with not sufficient care bestowed upon its shearing. Mr. Wm. King's is a good animal, well shorn. We like also Mr. W. B. Canning's, and also Mr. Walter's sheep. Mr. J. P. King's we cannot praise. Sir R. G. Throckmorton's wether is commended; a very fine animal, but amazingly full of wool all about the shoulders and fore-quarter, with scarcely any on the loin. The same exhibitor takes the silver medal for his Sussex Down ewe, a very pretty animal, with very fine quality of meat, a handsome head, and fine bone; but the judges might very properly have exercised a little more firmness, and have made an example of such clipping, for no one will believe that the natural difference in length of staple is a variation of a full inch between parts which should be full and outstanding, and other parts which ought to be level and straight, instead of high and protuberant. Lord Walsingham's commended ewe is a splendid animal, most beautiful in form, and, as far as we can judge, perfectly fairly shorn. The Earl of Radnor's ewe is also a fine specimen.

PIGS.

There are 45 entries of pigs, that is, 27 of three in a pen, and 18 single specimens, making in all 99 animals—about an average show. As to the character of the classes, they are so grand that the judges were obliged to call in one of the cattle judges to assist in their decisions, and, as may be expected, with so much room for differences of taste and opinion, some of the awards have been much canvassed and criticised. For pigs of any breed not exceeding 4 months old His Royal Highness the Prince Consort carries away first prize, with a pen of three little beauties of the white Middlesex breed, extraordinarily forward for their age. Mr. Geo. B. Morland, of Harwell, Berks, comes second, with three

but little inferior. Mr. Barber's are also grand in form and character, with fine hair. Mr. G. J. Gibbon's may be also highly praised. For pigs above 4 and not exceeding 8 months old, Mr. Wm. Baker, of Christchurch, wins with a magnificent pen of three black beauties, all exactly alike, and perfect in form and quality. Mr. Morland is second, with some of his white Chilton breed, especially beautiful; Mr. Crisp's are very handsome; those of His Royal Highness are exceedingly good; and those of Mr. S. G. Stearn, of Wickham Market, are so excellent in all respects that we consider them worthy of a prize. The class of pigs above 8 and not exceeding 12 months old is large and good. Mr. Morland's black pigs take not only the prize, but the Gold Medal. Mr. H. Wilson's black Essex pigs, and Mr. Barker's Middlesex pigs are especially worthy of favourable mention. Pigs above 12 and under 18 months old form a splendid class, all exhibited being good and meritorious. The prize pigs of Mr. G. Beale, of Lutterworth, are wonderfully grand, and supposed to weigh between 50 and 60 imperial stones each. Two of the three were highly commended at Birmingham; the third, we are told, was not there; it has a longer coarser hair, and is unlike its fellows; is it of the same litter? Mr. Crisp, of Butley Abbey, Suffolk, wins second prize, with some splendid specimens of his black breed. The Extra Stock Class is very splendid, and the entries in it numerous. The silver medal goes to Mr. J. King Tombs for a truly wonderful animal, a black Berkshire, of immense length, and still more surprising depth of carcass, with the smallest finest head and legs, presenting a maximum of splendid pork upon a minimum of bone and offal. Mr. Baker's white improved Hampshire is highly commended, a very prime specimen indeed. Mr. G. M. Sexton's is a magnificent black Suffolk; Mr. Samuel Druce shows an exceedingly good black improved Oxfordshire; Mr. Barnes has a capital heavy Berkshire; Mr. H. Wilson, a compact black beauty; Mr. Crisp, a magnificent animal; and Mr. Barber, a pretty well-fed white Middlesex. Mr. G. B. Morland's white Chilton, which was first in its class at Birmingham, is grand, and splendidly made up in all points; Mr. Beale's is extraordinary for fat and thickness at both ends; and Mr. Macraghton's Sussex is a black hippopotamus for size, though very handsome and with nice quality of flesh. Altogether the show of pigs is unusually good, and comprising many first-class animals.

PRIZE LIST.

FAT CATTLE.

JUDGES.—W. Bartholomew, Goltho, Wragby.

Joseph Druce, Eynsham, Oxon.

R. Warren, Childre Okeford, Blandford.

DEVONS.

STEERS, not exceeding 3 years old.

First prize of £25, W. Heath, Ludham Hall, Norwich, and silver medal as breeder, J. Quartly, Molland House, South Molton.

Second of £10, R. Wortley, Suffield Hall, North Walsham (*Disqualified*).

Third of £5, The Earl of Leicester, Holkham Hall,

Wells, Norfolk.—Sold to Mr. Petherbridge, Hastings-street, Brunswick-square.

Commended.—J. D. Dunning, Court Barton, Taunton.

STEERS or OXEN, above 3 years old.

First prize of £25, and silver medal to breeder, W. Heath, Ludham Hall.—Sold to Mr. Fisher, of 87, Cheap-side.

Second of £10, J. J. Farquharson, Langton House, Blandford.—Sold to Mr. Stone, Market-place, Junction-road, Upper Holloway.

Third of £5, J. Brake, Pauncefoot Farm, Romsey, Hants.—Sold to Mr. West, of Southampton.

Commended.—T. Bond, Park, North Petherton.—Sold to Mr. Page, of Plymouth.

HEIFERS, not exceeding 4 years old.

First prize of £15, and silver medal as breeder, R. Mogridge, Molland.—Sold to Mr. Newton, Tiverton.

Second of £5, J. J. Farquharson, Langton.—Sold to Mr. Hooke, Frederick-street, Hampstead-road.

Highly commended.—The Prince Consort, Windsor Castle.—Sold to Mr. Longman, King-street, New North-road.

The Class commended.

Cows, above 4 years old.

First prize of £20, and silver medal as breeder, W. Farthing, Stowey Court, Bridgewater.—Sold to Mr. Colebrook, Reading.

Second of £10, H. Bone, Avon, Ringwood, Hants.—Sold to Mr. Ginger, Union Terrace, Shepherd's Bush.

Third of £5, R. Farthing, North Petherton, Bridgewater.—Sold to Mr. Baker, Old Kent-road.

HEREFORDS.

STEERS, not exceeding 3 years old.

First prize of £25, H. Bettridge, Hanney, Wantage, and silver medal as breeder, W. Tudge, Ashford, Ludlow.—Sold to Mr. Linnell, of Windsor.

Second of £10, and third of £5.—*No competition*.

STEERS or OXEN, above 3 years old.

First prize of £25, L. Lloyd, Monk's Orchard, Bromley; and silver medal as breeder, J. G. Alford, The Thorne, Leominster.

Second of £10, G. Garne, Pointington, Sherborne.—Sold to Mr. Stockley, Montpelier-street, Knightsbridge.

Third of £5, W. Aldworth, Frilford, Abingdon.—Sold to Mr. C. Wilkins, Oxford.

Highly commended.—J. Towers, The Bull Ring, Ludlow.

HEIFERS, not exceeding 4 years old.

First prize £15, J. W. and C. James, Mappowder, Blandford; and silver medal as breeder, the late W. James, Mappowder.—Sold to Mr. Palmer, of Rotherham.

Second of £5.—*No competition*.

Cows, above 4 years old.

First prize of £20 Silver medal as breeder, and GOLD MEDAL as "best cow or heifer," R. Hill, Golding Hall, Shrewsbury.

Second of £10, W. Tudge, Ashford, Ludlow.—Sold to Mr. Silverside, York.

Third of £5, G. Pitt, Chadnor Court, Dilwyn, Leominster.—Sold to Mr. Harris, Hennington, Oxon.

SHORTHORNS.

STEERS, not exceeding 3 years old.

First prize of £25, The Duke of Beaufort, Badminton, Chippingham; and silver medal as breeder, W. Butler, Badminton.—Sold to Mr. Norris, Lamb Tavern, New Cattle Market.

Second of £10, G. N. Hulbert, Badgendon, Cirencester.—Sold to Mr. Cushen, Staines.

Third of £5, J. H. Langston, M.P., Sarsden House, Chipping-Norton.

Highly Commended.—R. Stratton, Broad Hinton, Swindon.—Sold to Mr. Harris, of Hennington, Oxon.

STEERS or OXEN, above 3 years old.

First prize of £25, silver medal as breeder, and GOLD MEDAL as "best steer or ox," R. W. Baker, Cottesmore, Oakham.—Sold to Messrs. Davis, Black Bull, New Cattle Market.

Second of £10, The Earl of Gainsborough, Exton Park, Oakham.—Sold to Mr. Keeble, The Lion, New Cattle Market.

Third of £5, J. Stratton, Manningford, Bruce, Pewsey, Wilts.

Highly commended.—C. Duffield, Marcham Park, Abingdon.—Sold to Mr. Copeland, Abingdon.

HEIFERS, not exceeding 4 years old.

First prize of £15, and silver medal as breeder, G. F. Heneage, M.P., Hainton Hall, Wragby, Lincoln.—Sold to Mr. Burnham, York-road, King's Cross.

Second of £5, R. Stratton, Broad-Hinton.—Sold to Mr. Heathcote, Birkenhead.

Commended.—W. W. Champion, Calcut, Reading.—Sold to Mr. Holton, King-street, Hammersmith.

Cows, above 4 years old.

First prize of £20, and silver medal as breeder, The Hon. Colonel Pennant, M.P., Penrhyn Castle, Bangor.

Second of £10, The Earl of Radnor, Coleshill, Berks.—Sold to Mr. Goring, of Staines.

Third of £5, The Earl Howe, Gopsall Hall, Atherstone, Sussex.—Sold to Mr. T. Philip, Seymour-place, Camden Town.

STEERS or OXEN, of any age.

First prize of £20, and silver medal as breeder, G. Coote, Torrington, Arundel.—Sold to Mr. Sharp, Brighton.

Second of £10, F. Tuppen, Westham, Eastbourne.—Sold to Mr. Stenning, Brighton.

Commended.—Tilden Smith, Beckley, Staplehurst.—Sold to Mr. Rudderforth, Pitfield-street, Hoxton.

HEIFERS and Cows, of any age.

First prize of £10, and silver medal as breeders, the late Messrs. J. and P. Gorringe, Pebblesham, Bexhill.—Sold to Mr. Hooker, Frederick-street, Hampstead-road.

Second of £5, Lord Leconfield, Petworth.—Sold to Mr. Withers, Guildford.

NORFOLK OR SUFFOLK POLLED.

STEERS or OXEN, of any age.

First prize of £10, R. Cooke, Livermere, Bury St. Edmunds; and silver medal as breeder, J. Chambers, Beechamwell, Swaffham, Norfolk.—Sold to Mr. Finch, High-street, Hounslow.

Second of £5.—*No competition*.

HEIFERS or Cows, of any age.

First prize of £10, R. Cooke, Livermere; and a silver medal as breeder J. Chambers, Beechamwell.—Sold to Mr. Povey, Nile-street, Hoxton.

Second of £5, J. Ellis, Artington, Guildford, Surrey.—Sold to Mr. Withers, Guildford.

LONGHORNS.

STEERS or OXEN, of any age.

First prize of £10, R. H. Chapman, Upton, Nuneaton; and silver medal as breeder, J. Godfrey, Wigston Parva, Hinckley, Leicester.

Second of £5, W. T. Cox, Spondon Hall, Derby.

HEIFERS or Cows, of any age.

First prize of £10, J. H. Burbery, The Chase, Kenilworth; and silver medal as breeder, the late S. Burbery, Wroxhall, Warwick.

Second of £5.—*No competition*.

SCOTCH HORNED.

STEERS or OXEN, of any age.

First prize of £20, the Duke of Beaufort; the breeder unknown.—Sold to Mr. Jeffery, Fouberts-place, Regent-street.

Second of £10, W. Heath, Ludham.—Sold to Mr. Petherbridge, Hastings-street, Brunswick-square.

Highly commended.—E. Rainforth, Monkhopton, Bridgnorth.—Sold to Mr. Jeffery, Fouberts-place, Regent-street.

Commended.—Lady Brinchman, Sundorne Castle, Shrewsbury.—Sold to Mr. Scarlett, of Goswell-road.

HEIFERS or Cows, of any age.

First prize of £10, and silver medal as breeder, Viscount Hill, Hawkstone, Shrewsbury.—Sold to Mr. Stephens, of North Audley-street.

Second of £5, the Duke of Beaufort.—Sold to Mr. Slater, of Kensington.

Commended.—T. Martin, Ashford Ford, Staines.—Sold to Mr. Collingwood, Lamb's Conduit-street.

SCOTCH POLLED.

STEERS or OXEN, of any age.

First prize of £20, W. M'Combie, Tillyfour, Aberdeen;

and silver medal as breeder, D. Martin, Bracco by Auld-girk, Dumfries.—Sold to Mr. Mann, Croydon.

Second of £10, W. Heath, Ludham.

Commended—R. Cook, Livermere.—Sold to Mr. Page, Great Tower-street, City.

HEIFERS or COWS, of any age.

First prize of £10, J. and W. Martin, New Market, Aberdeen; and silver medal as breeder, A. McWilliam, Boquharm, Huntly, Aberdeen.—Sold to Mr. Ives, Hampton Court.

Second of £5.—*No competition.*

IRISH.

STEERS or OXEN, of any age.

First prize of £10, and second of £5, with silver medal for breeder.—*No entry.*

HEIFERS or COWS, of any age.

The prize of £10, with silver medal for breeder.—*No merit.*

Second of £5.—*No competition.*

WELSH.

STEERS or OXEN (RUNTS), of any age.

First prize of £20, Colonel Pennant, M.P.; and silver medal as breeder, J. Jones, Tyn Llann, Llansadwyn, Menai Bridge.—Sold to Messrs. Early and Dunkley, Northampton.

Second of £5, F. Neale, Pagham, Chichester.—Sold to Mr. Ratcliffe, Shepherd-street, Mayfair.

HEIFERS or COWS, of any age.

The prize of £10, with silver medal for breeder.—*No entry.*

CROSS OR MIXED BREEDS.

STEERS, not exceeding 3 years old.

First prize of £15, and silver medal as breeder, T. R. B. Cartwright, Aynhoe, Brackley, Northampton (Angus and Shorthorn).—Sold to Mr. Botterell, Rochester-row, Westminster.

Second of £10, J. and W. Martin, Aberdeen (Aberdeen and Shorthorn).—Sold to Mr. Castle, of Hounslow.

Commended—J. Stewart, New Market, Aberdeen (Aberdeen and Shorthorn).—Sold to Mr. Garner, of West Brompton.

STEERS or OXEN, above 3 years old.

First prize of £15, and silver medal as breeder, R. W. Baker, Cottessmore (Shorthorn and Hereford).—Sold to Mr. Freemantle, Upper Hill-street, Richmond.

Second of £5, E. Beare, Paston, North Walsham (Norfolk and Shorthorn).—Sold to Mr. Palmer, Wentworth, near Rotherham.

HEIFERS, not exceeding 4 years old.

The prize of £10, A. Longmore, Rattie, Banff; and silver medal as breeder, J. Longmore, Hilton, Banff (Aberdeen and Shorthorn).—Sold to Mr. Fowkes, Queen-street, Hammersmith.

Very highly commended—R. Gibbs, Carhampton, Dunster (Shorthorn and Alderney).—Sold to Mr. Pitman, Bridgewater.

The class generally commended.

SHEEP.

LONGWOOLS.

JUDGES.—W. Bennett, Cambridge.

N. C. Stone, Aylestone, Leicester.

G. Turner, jun., Barton, Exeter.

FAT WETHERS, 1 year old (under 22 months).

First prize of £20, GOLD MEDAL as "best pen of longwools," and Silver Medal as breeder, T. Twitchell, Wilington, Bedford (Leicesters).—Sold to Mr. Parfit, Old Manor-road, Stepney.

Second of £15, The Hon. Colonel Lowther, Barleythorpe Hall, Oakham (Leicesters).—Sold to Mr. Hayhow, James-place, St. John's-road, Hoxton.

Third of £5, G. S. Foljambe, Osberton Hall, Worksop (Leicesters).—Sold to Mr. Saunders, Portland-street, Soho.

Commended—C. J. Bradshaw, Alstoe House, Burley on the Hill (Leicesters).—Sold to Mr. Phillips, Camden Town.

FAT WETHERS, 1 year old (under 22 months), each Sheep not to exceed 220lbs. live weight.

First prize of £20, and Silver Medal as breeder, G. S.

Foljambe, Osberton (Leicesters).—Sold to Mr. Barclay, Great Tichfield-street, Portland-place.

Second of £15, C. J. Bradshaw, Alstoe House (Leicesters).—Sold to Hall Brothers, Lower-road, Islington.

Third of £5, Hon. Colonel Lowther, Barleythorpe (Leicesters).—Sold to Mr. Fasey, King-street, Camden-town.

The class generally highly commended.

FAT WETHERS (not Leicesters), 1 year old (under 22 months).

First prize of £15, and Silver Medal as breeder, C. Kearsey, Glewstone, Ross, Hereford (Cotswolds).—Sold to Mr. Barclay, Great Tichfield-street, Portland-place.

Second of £10, T. West, Greenhill, Bletchington (true Cotswold).—Sold to Mr. Dartnell, Richmond-street, East-lane, Walworth.

Third of £5, W. Hower, Sevenhampton, Highworth (Cotswold).

LONG AND SHORT-WOOLLED CROSS-BRED.

JUDGES (and for Southdowns).—

W. Gulliver, Collingbourn, Marlboro'.

J. Roper, Clestone, Blandford.

W. Tanner, Patcham, Brighton.

FAT WETHERS, 1 year old (under 22 months).

First prize of £15, and Silver Medal as breeder—J. Overman, Burnham Sutton, Burnham-market, Norfolk (Southdown and Leicesters).—Sold to Mr. Fisher, Maida-hill, Edgeware-road.

Second of £10, J. White, Parsonage Farm, Rickmansworth (Down and Cotswold).—Sold to Mr. Collingwood, Highbury, Islington.

Third of £5, S. Druce, Abbey Farm, Eynsham (Oxford Down).—Sold to Mr. J. Stevens, Oxford.

Commended—J. B. Twitchell, Wilby, Northampton (Oxford Down, Southdown, and Leicester).—Sold to Mr. Saunders, Hampstead-road.

FAT WETHERS, 1 year old (under 22 months), each Sheep not to exceed 220lbs. live weight.

First prize of £10, and Silver Medal as breeder, J. Overman, Burnham (Southdown and Leicester).—Sold to Mr. Waller, Prospect-place, De Beauvoir Town.

Second of £5, G. Hine, near Oakley, Bedford.—*Disqualified.*

SHORTWOOLLED.

FAT WETHERS, 1 year old (under 22 months).

First prize of 20, and GOLD MEDAL as "best pen of shortwools," J. Kent, Goodwood, Chichester; and Silver Medal as breeder, The Duke of Richmond (Southdowns).—Sold to Mr. Stevens, Oxford.

Second of £10, W. Rigden, Hove, Brighton (Southdowns).—Sold to Mr. Davey, Brighton.

Third of £5, Lord Walsingham, Merton Hall, Thetford (Southdowns).—Sold to Mr. Botterell, Rochester-row, Westminster.

FAT WETHERS, 1 year old (under 22 months), each Sheep not to exceed 200lbs. live weight.

First prize of £10, and silver medal as breeder, W. Rigden, Hove (Southdowns).—Sold to Mr. Sharp, Brighton.

Second of £5, Sir R. G. Throckmorton, Bart., Buckland, Farringdon (Southdowns).—Sold to Cridlam and Redman, Chichester-street, Upper Westbourne-terrace, Hyde Park.

Commended—J. Kent, Goodwood (Southdowns).—Sold to Mr. Goringe, Lewes.

FAT WETHERS, 2 years old (above 22 and under 34 months.)

First prize of £20, and silver medal as breeder, Sir R. G. Throckmorton (Southdowns).—Sold to Mr. Fallard, Birkenhead.

Second of £10, J. and A. Heaseman, Angmering, Arundel (Southdowns).—Sold to Mr. Phillips, Western Road, Brighton.

Third of £5, J. Kent, Goodwood (Southdowns).—Sold to Mr. Wignell, Albany-street, Regents Park.

Commended—Lord Walsingham (Southdowns).—Sold to Mr. Phillips, Western Road, Brighton.

FAT WETHERS, of any Short-woolled breed, not South Down, 1 year old (under 22 months.)

First prize of £15, and silver medal as breeder, W. B. Canning, Chisleton, Swindon (West Country Downs).—Sold to Comfort and Sons, Farringdon-street.

Second of £10, S. King, Old Hayward Farm, Hungerford (West Country Downs).—Sold to Mr. Jeffery, Fouberts-place, Regent-street.

Third of £5, W. King, New Hayward Farm, Hungerford (West Country Downs).—Sold to Mr. Worley, Kensington.

Commended.—J. Walter, M.P., Bearwood, Walsingham (Hampshire Downs).—Sold to Mr. Carney, Charles-street West, Westbourne-terrace.

PIGS.

JUDGES.—W. Bennett, Cambridge.
N. C. Stone, Aylestone.
G. Turner, jun., Barton.

Not exceeding 4 months old.

First prize of £10, and silver medal as breeder, His Royal Highness the Prince Consort (Windsors).—Sold to Mr. Hedges, Bull Ring, Birmingham.

Second of £5, G. B. Morland, Chilton Farm, Harwell, Berks (Chiltons).—Sold to Mr. Gorton, Tichbourne-street, Haymarket.

Above 4 and not exceeding 8 months old.

First prize of £10, and silver medal as breeder, Wm. Baker, Purewell House, Christchurch (Hampshires).—Sold to Mr. Robinson, Westminster Bridge Road.

Second of £5, G. B. Morland (Chiltons).—Sold to Mr. Bonney, Cumberland Gate.

The Class generally commended.

Above 8 and not exceeding 12 months old.

First prize of £10, and silver medal as breeder, and GOLD MEDAL as "best pen of pigs," G. B. Morland (Chiltons).—Sold to Mr. Hedges, Birmingham.

Second of £5, G. Beale, Frowlesworth, Lutterworth (Leicesters).—Sold to Mr. Spice, Croydron.

The class generally highly commended.

Above 12 and under 18 months old.

First prize £10, and silver medal as breeder, G. Beale, Frowlesworth (Leicesters).—Sold to Mr. Mather, Lincoln.

Second of £5, T. Crisp, Butley Abbey, Wickham Market (Suffolks).—Sold to Mr. Sinsier, Knightsbridge.

EXTRA STOCK.

Silver medal for the best steer or ox in extra stock, the Earl of Leicester (Devon steer)—Sold to Mr. Collingwood, Westbourne-place, Paddington.

Silver medal for the best heifer or cow in extra stock, W. Farthing (Devon cow).

Silver medal for the best long-woolled wether in extra stock, G. S. Foljambe (Leicester)—Sold to Mr. Wadsworth, Shipperton-place, New North Road.

Highly commended.—L. Wilmore, the Newarke, Leicester (Leicester)—Sold to Mr. Lock, Kingston). R. Newman, Harroden, Bedford (Leicester)—Sold to Mr. Cussen, Tottenham Court Road). E. Riley, Kipling Coates, Beverley (Leicester)—Sold to Mr. Reed, Harrow Road).

Silver medal for the best long-woolled ewe in extra stock, Joseph Craddock, Eastington, Northleach (Cotswold)—Sold to Mr. Nichols, Upper Holloway).

Very highly commended.—F. Jordon, Eastburn, Driffield (Leicester)—Sold to Mr. Quelch, Walworth road).

Silver medal for the best cross-bred sheep in extra stock, J. Overman, Burnham (Southdown and Leicester)—Sold to Mr. Huxtable, Brook-street, Ratcliffe East).

Commended.—Lord Leicester (Southdown and Leicester)—Sold to Mr. Huxtable, Brook-street, Ratcliffe East).

Silver medal for the best short-woolled wether sheep in extra stock, J. and A. Heasman (Southdown)—Sold to Mr. Phipps, Western Road, Brighton).

Highly commended.—G. S. Foljambe (Southdown).

Commended.—Sir R. G. Throckmorton (Southdown)—Sold to Mr. Luxton, High-street, Camden Town).

Silver medal for the best short-woolled ewe in extra stock, Sir R. G. Throckmorton (Southdown).

Commended.—Lord Walsingham (Southdown)—Sold to Mr. Ratcliffe, Pickering Terrace).

Silver medal for the best pig in extra stock, J. K. Tombs, Longford, Lechlade (Berkshire)—Sold to Mr. Wood, Westminster Road).

Highly commended.—W. Baker, Purewell House, Christ Church (Hampshire)—Sold to Mr. Mull, High-street, White-chapel).

STEWARDS OF THE YARD.

OF BEASTS, LONG-WOOLLED SHEEP, AND PIGS.

Mr. J. Quartley, Mr. H. Smith, and Mr. C. Stokes.

OF SHORT-WOOLLED SHEEP AND CROSS-BRED SHEEP.

Mr. H. Waters, Mr. J. Ford, jun., and Mr. T. B. Northeast.

THE IMPLEMENTS.

The galleries were, if anything, more crowded than ever. There was an increase of exhibitors, and less room for each. The shifts some were put to, to make the best of their machines in the space allotted, were amusing; and though we had frequently to judge of the movement and character of the whole machine from a mere fragment, and to push our investigations by the light of analogy into dark corners, we have been successful in finding most of the entries. We will first give a passing mention of those which rank as the novelties of the Show.

Messrs. Burgess and Key, yielding to the general demand, have at length brought out a combined grass-mower and reaper for two horses, price £35, and another on the same principle, for one horse, price £22 10s. It is a combination of Allen's grass-mower, and an improved form of Hussey's reaper. To adapt the mower to the purposes of corn-cutting, the great central travelling wheel is shifted to the left, and a wheel of equal diameter is placed a little in advance of it on the opposite side. Upon an elevated seat, immediately to the left of this plain wheel, the driver takes his place, balancing and commanding the cutting bar, which makes a clear 4 feet 6 inches cut to his right. This plays at the back of the frame, receiving its motion in the usual manner from the travelling wheel on the extreme left. Behind runs a little wheel with wormed standard, fitting to a screw socket in the frame, by which the driver can raise or depress the level of the cutting bar. A platform is attached for corn cutting, to be cleared by a man with a rake. This folds up, and, with cutting bar, will pass through a gateway five feet wide. The adaptation of parts to the duties required appears very good. The one-horse machine, on the same principle, is very compact and simple. With a 3 feet 3 inches cut it will clear about seven acres per day. In this, however, the workman's seat takes its support from above the axle, and extends the breadth of the frame.

With the intention of meeting the difficulties of an English harvest, Mr. Samuelson has produced a combined, very cheap, and good grass and corn cutting machine. As a mower only, the price is £22; for double purposes £24. They are made for one or two horses. The frame is supported on two travelling wheels, both giving motion by internal cog-gear. The cutting-bar extends to the right, and for corn cutting is fitted with platform, one man leading the horse and the other behind, delivering by rake either at the side or otherwise, in sheaf or swath, as desired. The platform is capable of being suspended, to enable the machine to pass through gateways.

Wood's combined machine for cutting grass and corn, price £35, is so generally known, and has been so well advertised; that no special notice need be made of it here. Sampson and Jewell of Jersey, showed a very novel "paring and breaking cultivator," which received considerable attention, and a handsome testimonial from the Jersey Agricultural Society. A model only was exhibited in the gallery, but the real implement, some fifteen feet long, and seven feet wide, stood in the mews below, and this we saw. In operation it is intended to perform the entire work of the plough, scarifier, and harrow. A diagonal frame carries four small paring ploughs, and between them revolve forks and knives to cut the sod, or furrow-slice as it rises, and to throw it to

the off-side of the implement, leaving a furrow for the four horses to walk in. This implement may be used separately for paring, ploughing, or scarifying, and may be employed as a traction machine for steam power. Spiked bands are made, by a simple process, to embrace the hind wheels, to ensure the constant speed of the revolving forks, which are thrown in or out of gear as desired. For breaking-up old turf and preparing the ground for roots, this seems, so far as we can judge, from the simple view of it in a quiescent state, one of the most economical implements that have come beneath our notice. Fitted for paring and breaking the price is £25, delivered in London. The entire weight 13 cwt.

The patent hay and corn lift, exhibited by Mr. White, of Missenden, Bucks, deserves attention. It consists of a tripod formed of three poles, each 45 feet long, with 75 feet of 3 inch rope, and the necessary pulleys and slings. The body of the cart is lifted from the axle, and suspended at any height the builder of the stack requires, in two minutes from the time of the load drawing up. The man or men unload in the usual way, and all over-head pitching is got rid of. It saves much labour. The tripod is fitted with stretchers and rollers, so that it may be conveyed from place to place without being lowered; the price is £25.

Messrs. Dinsmore and Co., of Hyde-street, Oxford-street, exhibited an air-pressure churn, wherein the globules which contain the butter are not broken by means of dashers, but in process of falling from end to end against a large body of compressed air pumped in from above. A longitudinal revolution is given to the churn, the axis passing through the vouge. It is said butter is produced in ten or fifteen minutes; but we had no opportunity of judging. The price, with air-pump complete, of the 10-gallon size (with real capacity for 5 gallons), £2 5s.

Fourdrinier's portable hot-air kiln deserves attention of all those who are troubled with damp unsaleable corn. The kiln is 12 feet by 6. Five quarters at a time may repose upon the perforated bottom. Between the false and the real bottom is a space of 9 inches, through which is driven, by means of a fan turned by steam or manual labour, a constant stream of hot air from a small stove placed at one end. Thirty quarters can be dried in a day; and as the air does not come into contact with the fuel, the corn is kept perfectly sweet. The weight of the whole is about 35 cwt. The depth of the sides is three feet, but to these may be attached side-boards, and a tarpaulin covering. The price is £50. The use of merely cold air driven in this way through musty or damp grain will tend often to sweeten or dry it sufficiently. Mr. Fourdrinier may be addressed Grove Terrace, Peckham; and we mention this because there are many not at the Show who this year may be glad to correspond with him.

Having noticed a few of the articles which struck us as most novel, we now proceed to an examination of the several stands in their due order.

WILLIAM CAMBRIDGE, of Bristol: His noted powerful roller, and improved chain-harrow, an implement which has proved a very successful novelty, valuable on grass lands, in light land fallowing, and for other purposes.

HENRY GRATON, C. E., of 80, Chancery-lane: A beautiful working model of his new patent locomotive cultivator, which proposes to accomplish all the operations of Mr. Halkett's guideway system, without the permanent rails. The platform, say 50 feet broad, rests at each end upon a series of travelling wheels, which lay down their tramway for themselves, by means of a flexible India-rubber endless band, having segments of sleepers attached. Into the mechanism and merits of the invention we cannot enter now, as the description requires a considerable space in order to be intelligible; but certainly the difference in outlay between the purchase of this machine and the purchase of Mr. Halkett's machine and

permanent rails at every 50 feet, all through a farm, is a great consideration in favour of Mr. Grafton's notion.

ROWSELL, of Chard, Somerset: American turn-over horse-rake.

TASKER and SON, of Andover: An iron plough, with an attachment of the wheels, by which the plough-boy (for the intention is to ease the turning at the ends, so that a mere lad, instead of a man, may manage it,) on pulling a handle, sets the wheel-frame loose on the beam, so that the plough may be laid down on one side; and the upright wheel-stems turn in sockets, so as to lock by a parallel motion like a steering, and thus the plough is pulled by the horses short round, without lifting on the part of the boy. The only objection is the additional complication introduced into what should be the very simplest tool in its parts; for when laid out of use for a month or two, it is quite likely that rust, &c., would interfere with the nice action of the contrivance. However, it is very ingenious, and may prove to be a valuable improvement. The new mode of raising the skim-coulter by a simple screw movement, the stem having a screw-worm cut upon it, is just what was required for the continual alterations in depth found in ploughing lands or stretches.

E. WEIR, of High Holborn: Mr. Halkett's guideway rails and locomotive carriage wheels, shown in specimens of the actual size. The permanent rails are made all of wood preserved by a dressing, or of brick with angle-iron upon it. The comparative merits of Mr. Halkett's and Mr. Grafton's systems require too long a consideration to be discussed in this place. Mr. Weir offers to plough, hoe, reap, cart, &c., at one-third the present cost by horse labour; and though the wire-rope steam culture has achieved great things in economy of working, this offer deserves the earnest attention of the farmer.

Messrs. THOMAS GIBBS and Co., of Half-Moon-street, Piccadilly: Their usually magnificent collection of roots, mangold, carrots, swedes, common and tankard turnips of all sorts, including some mangold grown by His Royal Highness the Prince Consort, some splendid roots from the Woolston steam-ploughed farm, together with specimens of cereals, grasses, thousand-headed cabbage in pots, Pampas grass, beautiful samples of seeds of every possible variety required by the husbandman; and also framed and glazed specimen ears of Hallett's extraordinary red nursery wheat, raised by repeated annual selection from a single grain.

BUSBY'S AGRICULTURAL IMPLEMENT COMPANY, of Bedale, Yorkshire: A one horse cart, for which the firm is celebrated; a horse-hoe; plough; expanding ridge-plough; and Cuthbert's reaper, which now holds a place in the first rank as a cheap and unsurpassed harvester, in which manual raking-off is employed.

PRIEST and WOOLNOUTH, of Kingston-on-Thames: Drills and lever steering horse-hoe.

SUTTON and SONS, of Reading: A specially fine stall of roots, seeds, and grasses, including a 23lb. swede, which gained the first prize at Birmingham. The large green kohlrabi, the "champion" swede, the green and red and mottled globe and Pomeranian turnips, all suited to various soils, and producing a prodigious amount of food, some particularly fine. The mangel-wurzel, though not so large as on previous years, were particularly good for the season; most of those which won prizes at Birmingham, some of which were at Baker-street, having been grown by the customers. These seedsmen's stalls form a most important branch of the show.

THOMAS BIGG, of Great Dover-street, Borough: Sheep dripping apparatus, with vat, cradle, crane, and draining rack, elucidated by stuffed sheep.

GARRETT and SONS, of Leiston, Suffolk: Drills, patent lever horse-hoe, neat and compact portable horse-works, drawings of thrashing-machines, &c.

GEO. GIBBS and Co., Down-street, Piccadilly: A stand of seeds, roots, &c., including some magnificent drumhead cabbages.

WHITMEE and Co.: Corn-crushers and flour mills, for hand or power.

CLAYTON, SHUTTLEWORTH, and Co., of Lincoln: Drawings of their steam engines and thrashing machines.

B. EDGINGTON, of Duke-street: Sacking, rick-cloths, &c.

R. P. KER, of Liverpool: Roots, samples, &c.

BARNARD, BISHOP, and BARNARD, of Norwich: Disc turnip-cutters, disc root-pulpers, oat-bruisers, &c.

J. LLOYD and SON, of Old-street Road: Flour mills, &c.
E. R. and F. TURNER, of Ipswich: Their well-known roller mills, oat, malt, and linseed crushers, &c.

E. PAGE and Co., of Bedford: Three "Eclipse" ploughs, diagonal harrows; chaff-cutters for hand and steam power; and their simple, cheap, and valuable machine for making either tiles or bricks, by which vast labour is economized and the rate of production multiplied.

ST. PANCRAZ IRON WORKS CO.: Stable fittings and furniture of all sorts.

SMYTH and SON, of Peasenhall, Suffolk: Their noted corn and turnip drills.

J. MAJOR, of Park-lane, Piccadilly: Veterinary medicine chests, drugs, lotions, and other horse and cattle remedies.

PAGE and TOWGOOD, of Southampton: Roots, seeds, &c., including carrots of His Royal Highness's growth. Fluke potatoes are shown here, grown this year by Jos. Blundell, Esq., Secretary of the Botley Farmers' Club, Hampshire; the crop alleged to have been sold for £20 per acre, while 28 tons of turnips per acre were simultaneously produced between the potato rows. This is a case of agricultural maxima worth inquiring into.

WM. SKIRVING, of Liverpool: Some good roots; the swedes very large, though from ordinary field culture, and, with not special manuring, having given (it is said) 45 tons per acre this year.

RD. HORNSBY and SONS, of Grantham: Drills, winnowing machines, and their new ploughs, with lever neck for adjusting the share, having a spherical joint to allow of alterations in position in any direction. Instead of having a framework for the body of the plough, attached by bolts through the beam, there are two legs welded to the beam, and to these are fixed the slip or slade, and the mouldboard. One objection to this mode of construction, without separate additional pieces for the soil, land-side, &c., is that the wearing away of the slade throws the whole form of the implement out of truth; but as the metal is very hard, the wear is very slight, and a new slade costs only three or four shillings, and can be attached by any ploughman. A large plough is here shown, made for turning a furrow either 18 inches wide by 12 deep, or 20 inches wide by 18 inches deep, intended for the West Indies.

D. KITTMER, of Fulstow, Lincolnshire: Winnowing machine.

A. and E. CROSSKILL, of Beverley: One-horse cart constructed by machinery, models of waggons, and the patent clod-crusher.

CORNELL, of Cheltenham: Portable steam boiler.

JAMES, of Cheltenham: Washing machine, clothes wringing machine, and liquid-manure cart.

BOBY, of Bury St. Edmunds: Screens, some with a blower attached, very perfect in their action.

BURNLEY and BELLAMY: Iron cisterns and troughs.

COLEMAN and SONS, of Chelmsford: Their cultivator, and the rotary potato-digger, row with an improvement in the shape of the share and in the position of the revolving forks, by which the tubers are tossed out, and not buried again with loose earth so much as heretofore.

RANSOMES and SIMS, of Ipswich: A very extensive show, including their iron ploughs, a new YX plough, made with a short beam so as to be used as a swing plough at pleasure, the handles braced diagonally by oval iron braces; specimen fragments of chilled cast-iron shares, showing how the upper surface being softer than the under, wears away first, thus preserving the cutting power of the edge; also their clever rotary corn-screen, with the recent addition of a conical screen at the upper end, for separating stones and dirt, and ejecting them from the machine; their roller mills, oat-crusher, bean-cutter, &c., and the horizontal root-slicer, which leaves no last piece.

J. and F. HOWARD, of Bedford: Their new lever-action horse-rakes, jointed two-beam harrows, large iron zigzag harrows, and iron ploughs. The plough mouldboard is made with a gentle rise, and is so formed as to pack the furrow slices well together, and leave at the same time a beautiful sharp edge, as well as cutting a perfectly level bottom. A beautiful drawing of their new Britannia Iron Works is shown; also a plan of Mr. Smith's Woolston steam cultivator at work.

PLENTY and PAIN, of Newbury: A water-cart, and galvanized iron troughs.

BAKER, of Wisbech, Cambridgeshire: A winnowing and blowing machine.

SMITH BROTHERS, of Thrapston, Northamptonshire: chaff-cutter, mills, and a novelty in the shape of a new haymaking machine. Instead of a number of broad rakes, each with many teeth, a set of two-tined forks are arranged upon a couple of light barrels to come successively into action, thus picking up small portions instead of great lumps of hay altogether. It has a very simple reversing motion, ingenious provision for lubrication—a point not sufficiently attended to—and the revolving parts are so shut in and protected that no grass can gather round them. This, one of the few really novel implements in the exhibition, is deserving of some attention.

EATON, of Thrapston: Dressing-machine, circular sheep crib, screw-jacks, and lifting-jacks.

P. LAWSON and SON, of Edinburgh: Large and beautiful display of dried specimens of grasses, corn, &c., splendid quality of roots, including 84 sorts of turnips only, most of them grown at an altitude of 1200 feet above the sea; nursed and artificially-grown roots do not show, but quality and purity of stock are represented, because more valuable to the farmer; whereas forced roots are much on a par with the forced cattle which used to be exhibited below-stairs a few years ago. Major Quenton's giant wheat, the new grey-stone turnip, and the holcus saccharatus form part of the attractions of this stand.

JOSEPH GARDNER, Banbury: His well-known turnip cutter, and the improved chaff machine, cutting two lengths.

EDGINGTON, Tooley-street, London: A collection of rick cloths, cart and waggon covers, ropes, and sacks.

JOHN UNITE, 130, Edgeware Road, London: Rick cloths, sacks and ropes, &c.

J. BRAGGINS, Banbury: A patent combined and strap hinge, for hanging and regulating park and field gates. Oak gates, with hinge complete, £1 5s.

R. & J. REEVES, of Bratton, Wiltshire: Their liquid manure drills and common drills, of excellent workmanship.

H. CLAYTON, Atlas Works, Dorset-square, London: A model of the steam brick and tile machine, by which some 25,000 bricks are turned out per day with an eight-horse engine. Also diagrams of a system for drying large haikes of bricks quickly by artificial means; and when they are turned out so rapidly, of course such a provision is requisite on account of the vast space they would occupy on the old plan.

HILL and SMITH, Dudley: A small assortment of their specimens of wire work and park fencing, now coming into general use.

J. SEAMAN, Worcester: His "Excelsior" harrows, the bulls being tubular and in separate lengths, penetrated by a bolt screwed and braced together at the ends. The nuts are therefore just reduced from 20 to 5 in each harrow. The plough with trussed beam showed good workmanship, and one or two improvements.

MARSHALL and SONS: Saw benches, &c.

J. BRADFORD, Manchester: Steam washing apparatus and chaff cutter.

BONDS and ROBINSON, Halesworth, Suffolk: A very useful hoe for cleaning mangel wurzel, deserving of extensive trial. Price £2.

J. SPIGHT, Brigg, Lincolnshire: The celebrated horse hoe, fully described in our report of the Hull Meeting. Its mechanical principle is so good, and adapts it to work on all classes of soil, amongst turnips, wheat, and all spring crops, and its workmanship is so excellent, that we cannot but highly recommend it to all who may peruse this report. Its construction is very simple, and yet it seems adapted to all conceivable motions required in hilly or flat districts, of a horse hoe. For seven-rows, with wheat, bean, and turnip hoes complete, £15.

G. W. ROBINSON, Barton-upon-Humber: A good clod crusher, with self-cleaning rings of different diameters; width 5 feet 3 inches; weight 15 cwt. Price £14.

MAGGS and HINDLEY, Bourton, Dorset: Their original and excellent straw-thatch-weaving machine. To those who know what it is to suffer from summer rains upon uncovered stacks, we need not recommend an apparatus, by means of which they can thatch down without delay, at a cost of about 10d. per square of 100 feet, inclusive of all expenses save the value of the straw: it speaks for itself. The thatch is woven

during rainy days in winter, and laid by. It forms an excellent protection for sheep against cold winds—nay, it may be used as netting, or as a fence for poultry. To every brick-yard it is a most valuable adjunct, saving that waste in straw, which in some neighbourhoods proves the brickmaker's largest expense. The straw or rushes are woven from 18 inches to 5 feet wide, from 1 inch to 3 inches thick, and any length that may be required; the warp consisting of fine wire.

HOLMES AND SONS, Norwich: Their deservedly celebrated drills; in Norfolk and other counties well known and approved.

J. FERRABEE & Co., Stroud: Their improved chaff and litter cutting machine, fitted with safety stop and reverse gear, for cutting $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, and 1-inch chaff, and 5 and 6-inch lengths for litter. Price £16 16s., for hand or horse-power.

CHILDS AND OWEN, New Oxford-street, London: The steam-driven smut and scouring machine, now much used by millers, &c., from £25 to £35. The grain separator, already well known.

KIRBY, Banbury: Chaff cutters and turnip cutters.

W. BALL, Rothwell, Northamptonshire: His superior well-trieved ploughs, with strong well-made cart.

WALLIS AND HASLAM; Their own prize corn thrashing machine. Boby's screen, fitted with blower; Seaman's patent harrows; and dressing machine

B. SAMUELSON, Banbury: His reaper, already mentioned; haymaker, a simple effective machine, price 13 gs.; Gardner's turnip cutter; chaff cutters; and simple cake breaker.

WOODS, of Stowmarket, Suffolk: His capital and cheap oat bruiser and bean mill, £5 15s. Corn mills of various sizes, all strong and simple and excellent. Pulper, £4 15s.

W. NICHOLSON, Newark: His prize cake breaker, £3 15s., a very effective implement; prize haymaker, now so generally used; and simple sack lifter of wrought iron, price 15s.

B. FOWLER & Co., Whitefriars, Fleet-street: A large display of pumps (lift and force), hydraulic rams, manure double-barrel liquid manure pump, &c.

J. WARNER & SONS, Cripplegate, London: Also a variety of pumps, with valves so contrived as to admit of repair with great facility. These pumps are of exceedingly good workmanship, and very cheap.

J. TREE & Co., Charlotte-street, Blackfriars Road: Ewart's valuable cattle gauge, in various forms, &c.

WEDLAKE & Co.: A considerable assortment of good implements—the oat bruiser and haymaker being prominent.

CROSSKILL, W., (Trustees of), Beverley: A very lengthened display of well-made carts, waggons; many in model, of water carts and clod crusher, &c.

COTTON & HALLEN: Their excellent stable fittings.

STACY, Uxbridge: Useful chaff cutters.

HERNULEWICZ & Co., Delahay-street, Westminster: A patent log-sawing machine, which gives great economical advantages, and may be particularly recommended to our German and French friends, who use wood so generally for fuel, price £4 10s.; a simple little machine for setting scythes, price 12s.; and specimens of very ornamental iron gates and fencing.

CARSON & TOONE, Warminster: Moody's turnip cutters and turnip graters, which are especially valued for separating the dirt in the process of cutting, price £4 10s., on iron frame. A Canterbury prize chaff cutter, which with 2½-horse power will cut one ton of hay per hour for bullocks, fitted with three knives and two pairs of feeds rollers, stop and reverse gear—all very simple, and under the immediate command of the feeder, price 13 gs. A cheese press, &c.

E. H. BENTALL, Maldon: His unsurpassed pulpers, which have inaugurated and perfected a system of feeding in this country, of which the animals below represented the profitable effects, and so proved one of the best possible of advertisements to thinking men, which this clever inventor could put forth. Besides the pulper for steam appliances, and the £6 and £5 sizes, there is now one for four guineas, which was much wanted for small occupations. A variety of his capital corn mills of excellent workmanship, and of chaff cutters of great simplicity and merit; indeed, no stand is so full of valuable appliances for quick and economical feeding.

AMIES & BARFORD, Peterborough: A very efficient cake breaker of great capacity and strength, making the fines sample of ground cake in the galleries, weight 4 cwt.; price £5 10s., for steam power or manual labour. Roller with two

wrought iron cylinders, 3-16ths of an inch thick, and wrought iron frame 18 inches diameter, weighing 7 cwt.; price £8. Also Stanley's portable farmers' steaming apparatus, now so extensively used; price £18 10s.

PICKSLEY & SIMS, Leigh, Manchester: Corbett's cast iron cylinder pulper or grater, £6 10s. Bone mill and chaff cutters and corn crushers of excellent quality.

HAYES, of Elton, near Oundle: His prize pair-stone grinding mill and flour-dressing machine.

R. & H. CRISP: A variety of specimens of gutta percha tubing, &c.

THE SWAN-LANE COMPANY, under whose capacious shade several birds lodged: A selection of various useful implements, well chosen.

THE AGRICULTURAL ENGINEERS' COMPANY's patent bituminized paper pipes, which are supposed, and we may say, proved to possess all the qualities necessary for the conveyance of water gas sewage. They are about one-fifth the weight of iron pipes, and about half their price. They are usually used in lengths of 7 feet, of any diameter, and of any form, and are connected by socket joints. In London they have been found to resist 220 lbs. to the square inch. Danchell's useful filter for cottage purposes, to which attention should be directed by all employers of labour, and those who seek the welfare of the poor, price 4s. Bleckhorn and Shuttlesworth's Spalding fire engine and force pump, which weighing only 4½ cwt., possesses a power equal to force 100 gallons of water per minute 90 feet high. We never saw a more compact or better-finished machine. The valves too are within such easy reach, price £24.

MASON, Ipswich: Some exceedingly good portable boilers and steaming apparatus from £2 10s.

RICHMOND and CHANDLER, Salford, Manchester: A specimen of the beautifully-finished chaff-cutter, which received the prize at Canterbury, cutting two lengths without change of wheel, but only by means of simple clutch movement, price £5 10s. The powerful No. 4 machine, which lately astonished the Russians at St. Petersburg, and carried off the prize for steam-power. Any one who loves good workmanship and mechanical arrangement may linger long over the truly turned spindles, and nicely perfected parts, there seems such perfect adaptation of the parts to the duties they have to perform. Also specimens of their valuable corn-mills, and capital horse-gear, price £10. Some objections are made to the great weight employed to press down the feed; but as the choice lies between two difficulties—the use, &c. of this weight, or unevenness of cut—we do not see that it is valid.

ASHBY and Co., Stamford: Their excellent chaff-cutter, with spring mouth-piece, so well spoken of; the haymaker, now widely known, and one specimen of his pretty little 2½-horse steam engine for facilitating feeding operations.

J. S. HANCOCK, 174, Upper Thames-street, London: His patent grass-land cultivator, by which he proposes to pulverize the soil below the sod without injury to the turf, to a depth of from 9 to 12 inches, price £7 10s. The value of the "Pulverizer Plough" for arable land is now established; but care should be exercised in meddling with good grass land.

BARRETT, EXALL, and ANDREWES, Reading: A small assortment of corn-mills, chaff-cutters, and a small horizontal cylinder engine, displaying workmanship of their usual excellence.

CROGGER and Co., Dowgate Hill, London: Specimens of the roofing, boiler, and ship-sheathing felt.

SAWNEY, Beverley: His excellent winnowing and blowing machines.

PATTERSON, Beverley: Patent compound-action mills; strong and useful for grinding horse, cattle, and pig food.

SMITH, Kettering: His prize six-row horse-hoe, all kinds of drilled crops, in ridge or flat work, to be steered with the greatest nicety.

DRAY: A Hussey reaper, with tipping platform.

J. B. BROWN and Co., Cannon-street, London: A great assortment of leading implements, with iron and wire fencing, &c.

COGAN, Leicester-square: A capital little instrument for testing the purity of milk, price 1s. Various specimens of glass dairy utensils.

HUGHES and SONS, Great Dover-street, London: Specimens of French mill-stones of very excellent quality, together with an efficient smut machine, well recommended.

READ, Regent-circus: Various probangs, injecting instruments, watering machines, and patent greenhouse syringes, made and finished with great care.

We have not space to say much with respect to the important branch of the implement trade represented by the engines below the galleries. Clayton and Shuttleworth, of Lincoln, as usual, exhibited fine specimens of workmanship, also Tuxford and Sons, of Boston, in the vertical cylinders. Hornsby and Sons, of Grantham, were there with their prize machine. Garrett and Sons, Leiston; Barrett, Exall, and Andrews, and Haywood, of Derby, with vertical exterior cylinders. Brown and May, of Devises; Ruston, Proctor, and Co., Lincoln, engine and thrashing machine, with improved shaker, and simplified machinery, allowing for the abandonment of several bearings and straps. T. W. Aveling, Rochester, a portable engine made locomotive by endless chain. A disc wheel is mounted on an upright shaft for atereage, an arrangement to be adapted to any engine. The Swan-lane Company: Vertical boiler engine, 2½-horse.

We understand that a fair share of business has been done during the week, and hope manufacturers have returned to their workshops more encouraged than they expected to be.

May none of the artisans and labourers, whose busy hands have contributed to the success of the exhibition, lack the substantial and national pleasure of the coming season.

THE SMITHFIELD CLUB.

THE ANNUAL DINNER

Took place on the Wednesday evening, at the Freemasons' Tavern. The attendance was considerably less than usual, between fifty and sixty only sitting down. Lord Berners, as the new President, was in the chair. There were also present, Mr. Charles Barnett, Mr. Fisher Hobbs, Mr. Reginald Upcher (nephew of Lord Berners), Mr. Jonas Webb, Mr. Thomas Greetham, Mr. James Hole, Mr. Wm. Torr, Mr. T. B. Northeast, Mr. R. Overman, Mr. E. Pope, Mr. James Quartly, Mr. Wm. Rigden, Mr. Robert Smith, Mr. Charles Stokes, Mr. Wm. Sanday, Mr. Henry Smith, Mr. Thos. Twitchell, Mr. G. P. Tuxford, Professor Simonds, Mr. H. Corbet, Mr. S. Sidney, Mr. S. Austey, Mr. B. E. Bennett, Mr. W. H. Baker, Mr. John Clayden, Mr. Westwood Chafy, Mr. Chafy, jun., Mr. Henry Fookes, Mr. John Ford, jun., Mr. Edwd. Frost, Mr. John Giblett, Mr. L. Willmore, Mr. H. Waters, Mr. Brandreth Gibbs, Mr. Joyce, Mr. Eaton (from the Cape of Good Hope), &c., &c.

After the usual loyal toasts had been given and duly responded to,

The CHAIRMAN, in proposing "The Army, Navy, and Volunteers of England," said he wished to pay a tribute of respect to the late Duke of Richmond, a distinguished member of the army, who was for 15 years president of the club, and under whose auspices it had risen to the eminent position it now held. Looking to the Duke's life from an early period, they saw that a sense of duty was the guide and rule of his conduct (Hear). He had acted as aide-de-camp of the late Duke of Wellington, and distinguished himself among the distinguished and gallant men of that day. They had seen him afterwards appointed by his sovereign lord-lieutenant of the county in which he lived, and acting as the head of the magistracy in a manner which excited their admiration. They had also witnessed him in both houses of parliament always ready to do his duty, and he was never absent when the cause of agriculture was at stake. He might indeed be truly said to be the farmer's friend. Under every relation of life he conducted himself in a manner which ensured for him the approbation and esteem of all who knew him (cheers). With regard to the army, he would only say that the most recent telegrams from China showed that our soldiers had lost none of the bravery which they evinced in past times (Hear). He also believed that the navy, whenever it was called upon to act, would always recollect the words of the great captain, Nelson, "England expects every man to do his duty" (Hear, hear). That was the motto both of the army and the navy, as he was sure it was of that loyal and gallant body of men the volunteers of England, who at a moment of distrust, which made the loyalty of the people burst forth, enrolled

themselves in defence of the country, and who he knew would give a good account of any enemy who attempted to invade our shores (cheers). He would now give the toast, which he asked them to drink in silence, in remembrance of him who had gone—"The Army, Navy, and Volunteers"—knowing that every company of Englishmen was ready to pay tribute to those to whom tribute was due.

The toast was, in accordance with the noble lord's wish, drunk in solemn silence.

The CHAIRMAN, in proposing the toast of the evening, said that, having received a communication from Lord Leconfield respecting a testimonial to the late Duke of Richmond, he wished to say a few words on the subject. Some years since there was a proposition for a testimonial to the Duke, to be called "The Richmond Institution," and he had written to ascertain what had been done with regard to that proposal, for which funds had been raised. Since then a communication had been laid before the Royal Agricultural Society, to the effect that some Sussex gentlemen were about to raise a sum for a memorial to the duke, the subscriptions to which should not exceed three guineas. (Hear, hear.) He had, at the request of Mr. Mechi, called upon Mr. Davidson, of Spring-gardens, who had given him a statement of the funds contributed to the Richmond Institution; and he added that, though he was not authorized to say what were the wishes of the present duke, he yet conceived it would be gratifying to his grace and his family if those who wished to contribute to the memorial gave their money to the Institution, the funds of which amounted to £1,900 in consols and £108 in cash. The proceeds arising from that amount had hitherto been expended in annuities to four widows of decayed farmers. (Hear, hear.) The Smithfield Club, as most of them knew, was established in 1798, and in 1800 it only mustered fifty members. He remembered perfectly well a meeting in that identical room, presided over by the late Lord Spencer, when a much larger party than he now saw was present, from which emanated the Royal Agricultural Society. (Hear, hear.) He should mention that the show of the club was visited by her Majesty in 1840, in 1850, and again in the present year, when she remained for a couple of hours examining the stock and implements with the greatest attention and interest. (Cheers.) His Royal Highness the Prince Consort had also inspected the show, and it was further honoured with the presence of the Empress of the French, of whose visit a somewhat ludicrous account had been given in the newspapers, it being said that she was forced to disclose her name, inasmuch as it was against the rules of the club to admit any but royal persons on Saturday (laughter). The Empress examined the various agricultural implements with much attention, and seemed anxious to know and understand how they were employed. She also inspected the cattle and sheep, and especially the pigs, which were something she had never seen in France (laughter). This was an honour conferred on the Smithfield Club which would be long remembered (Hear, hear). The shows of the club were removed to Baker-street in 1840. He well remembered the first meeting in Goswell-street; and the 50 members they had at that time had now increased to between 300 and 400. He could not but express a hope that the resolution come to by the club to remove to other quarters would be highly conducive to its prosperity (cheers). No gentleman present at the show yesterday, or at any previous meeting, could fail to be struck by the inconvenience arising from the limited space and the darkness of the building; and the unwholesome atmosphere of the committee-room gave an additional reason why a change in their position should take place (Hear, hear). With regard to the finances of the club, he was glad to state that they had a balance in hand of £2,598, and an annual income of £1,500. The committee intended to recommend the opening of additional classes for Mountain sheep, for Shropshire, and for Kent and Romney Marsh sheep (Hear, hear). At the Royal Agricultural Show at Canterbury, it was seen that there was room for great improvement in the Romneys; and an advance was now being made in that direction. He had also the pleasure of congratulating the Shropshire men on their sheep having assumed more of the character of the Southdowns, with greater size, and a larger quantity of meat. He had also taken much interest in the Cotswolds for nine or ten years; and every year he saw an improvement in them; and the

present show contained several which he knew would be praised by the butchers, who were generally deemed good judges. It could not, therefore, be doubted that the club did good by improving the different breeds of sheep. They had increased the amount distributed in prizes and medals by £300, making a total of £1,500 (Hear, hear). The noble Lord concluded by giving "Success to the Smithfield Club," which was drunk with enthusiasm.

The HONORARY SECRETARY (Mr. B. Gibbs), then read the awards of gold medals, which were presented by the Chairman to such of the winners as were present.

Mr. C. BARNETT regretted that the toast he was about to propose had not fallen into better hands, though no one in the country could propose it with greater sincerity and pleasure than he could. He had been associated in friendship with the chairman, he might say, during nearly the whole of his life. Not only had they met at college, but also in the hunting-field, where some of the best feelings of nature were created and disseminated (cheers.) The toast which he had risen to propose was, then, "The Health of Lord Berners," who was acting as their president on that occasion (cheers.) And he would add, that his Lordship would not appear in that capacity merely on the present occasion, but would also be President for the next year, having just been appointed to discharge the duties which so long devolved on one upon whom he had passed so deserved an eulogium.

The toast having been drunk with great cordiality.

Lord BERNERS, in responding, said his old college friend was rather mistaken, as it had been arranged at a meeting of the Club that there should be a new president every year. He could promise that he would always heartily and sincerely endeavour to promote, not only the prosperity of this, but of all other societies having for their object the advancement of agriculture. He felt most strongly that the interests of the landlord were entirely identical with those of the tenant; and that the interests of both were bound up in the welfare of the labourer; indeed, the prosperity of the three was essential to the welfare of our social state. Agriculture was the basis of the prosperity of this kingdom, and if agriculture did not prosper all the other classes of the community would proportionably suffer. He could assure them he would avail himself of every opportunity in Parliament to promote the interests of all connected with the land, and this he would add was a period when subjects affecting them were likely to be brought prominently before the legislature. On that day, for instance, a meeting had been held with the view to obtain some improvement in the outfall of rivers and streams, which was a subject of very great importance. There was also another question of considerable interest which had been brought before the Council of the Royal Agricultural Society, namely, how the sewage of towns could be best applied to agricultural uses. Many other subjects of nearly equal interest were also in agitation, and it was to a society such as this that the members of both Houses of Parliament looked for information (Hear, hear.) The Noble Lord then pointed out the advantages which the society had conferred on agriculture generally, and, by way of illustration, how some of the epidemics amongst cattle and sheep had been suddenly stopped by Professor Simonds, Veterinary Surgeon to the Royal Agricultural Society, who was about to visit Plymouth, in order to ascertain the cause of so much mortality amongst stock in the west country.

Mr. FISHER HOBBS said the toast which he had to propose included a body of noblemen and gentlemen, whose inability to attend that day they must all regret. He trusted that the wholesome arrangement lately made, under which a president was to be elected every year, would be attended, at all events, with this good effect, that many of the vice-presidents would feel it their duty to be present on all occasions like that; so that in future years the tables would be much better filled, and there then would soon be a recurrence of the olden times, when that room was hardly large enough to hold the landowners and farmers who assembled at the annual festival (cheers). On an occasion like that he rejoiced to hear practical remarks, like some of those which had fallen from the noble lord in the chair. He (Mr. Hobbs) had himself received most valuable assistance from Professor Simonds, in two instances. In the first instance, having bought 400 lambs early in the

Autumn, he found that they were dying off very fast. The disease being so serious, he telegraphed at once to Professor Simonds, who came down immediately, and after the Professor's arrival he lost only two lambs, though previously he lost within two or three days nearly a score. He believed that the advice which he received on that occasion had saved him £100. The other case was one in which a number of pigs were dying off, and nobody could tell what was the cause. The truth was he had been feeding them with cabbages about half-grown, containing 90 per cent. of water; this turned out to be the source of his loss; and the Professor remarked to him that he must have found, to his cost, that pork and cabbage did not always agree. He concluded by proposing "The Trustees and the Vice-Presidents, coupled with the name of Mr. Charles Barnett."

Mr. BARNETT, in returning thanks, expressed his regret at the absence of his co-trustees, Mr. Grantham and Mr. Druce, with whom, he said, he felt great pleasure in being associated. Having undertaken to remain in office under a new state of things—he might almost say under a new régime—he wished briefly to express his sentiments on that point. When the question was first mooted of changing the place for holding the Smithfield Show, he had certainly a strong feeling that it would be better to go to the west than to the east, because he thought people in general were more likely to go from the east to the west than from the west to the east. But he was not bigoted in any opinion, and when he found it probable that if they went westward at all it would be to the far west (Hear, hear), and that too at a remote period, he then turned his attention to the question, what was the next best scheme that had been suggested; and on examination he found that none had been brought forward better than the one which had now raised its head above all suspicion. (Cheers.) It was gratifying to him, and he believed it was satisfactory also to all who were associated with that scheme, that a fair and honourable opposition was offered, seeing that the result of that opposition was that the whole subject had been fully and fairly ventilated. (Hear, hear.) The scheme was promoted by gentlemen whose character was above all suspicion (Cheers), and whose object he felt quite certain was no other than that of promoting, not their own pecuniary interest, but the interest of that club. (Cheers.)

Mr. JONAS WEBB proposed "The Health of the Judges," none of whom were present; and Mr. HOLE that of "The Stewards."

Mr. QUARTLY, in returning thanks for the stewards, threw out a hint to the breeders and exhibitors of stock that they would do well in future to pay a little more attention to the certificates they signed. (Hear, hear.) It was a very unpleasant thing to the exhibitor, no doubt, to have his certificate treated as doubtful, and to be called upon to prove its accuracy; but he could assure them that it was quite as painful to the stewards to have to summon the breeder on every such occasion (Hear, hear). He hoped, therefore, that a circumstance or two which had recently occurred would never be repeated, and that the breeders of cattle would be so particular in signing certificates as not to bring upon the exhibitors any blame. (Cheers.)

The CHAIRMAN then gave the health of Mr. Brandreth Gibbs, the honorary secretary, which was very cordially responded to.

Mr. GIBBS, after acknowledging the compliment, said, on rising, his mind turned at once to the past, the present, and the future. As regarded the past, there was one subject to which he could not refrain from alluding. He missed, on that occasion, the noble Duke who had filled the presidential chair for so many years; and he should not do justice to the office which he held now, nor to his own feelings, if he did not pay some little tribute to the noble Duke's memory. Having held the office of secretary previous to, and during the whole of the time of the late Duke of Richmond's presidency, he had perhaps greater opportunities than any other member of the Club of observing the deep interest which he took in its prosperity; and he could not, therefore, but express, as he did most sincerely, his deep sense of the irreparable loss which they had sustained. Words failed him, and a pause of silence was perhaps the most fitting mode of indicating what he really felt.—As regarded the present, he must congratulate those whom he addressed that they had for their president a nobleman who had for many years taken a lively interest in

the proceedings of the Club; and he would venture also to congratulate his lordship that he had entered on the duties of his office at a period when the Club was certainly in a more prosperous condition than it had ever been before, since it was established (cheers). With respect to the future he could say but little. They were, of course, all aware that a majority of the members of the Club had decided that the show should be removed to a new building to be erected at Islington. He trusted that by this time next year all the preliminaries would be in so forward a state that he would be able to address them at greater length on that subject. On that occasion he would merely say that he thought that when such a question had been settled by a majority, the minority ought to fall in with the views of the majority, put their shoulders to the wheel, and unite their efforts with those of others for the common good (loud cheers). For himself, he could only say that he should always be ready, and it would afford him the greatest pleasure to give the directors of the new company any suggestions and any information which it might be in his power to afford, with a view to the erection of such a building as would at once do credit to them, and meet the increasing demands arising from the growing prosperity of the Club (cheers).

Mr. TORR proposed "The Health of Mr. C. T. Tower, of Weald Hall, the Senior Member of the Club," who, however, was not present. Mr. Torr, in doing so, dwelt on the improved character of the breeds of stock, and that early maturity which the proceedings of the Club had done so much to develop.

Mr. G. P. TUXFORD said he had been requested by the Chairman to propose a toast of very great importance, viz., "The Royal Agricultural Society of England." The late Sir Robert Peel, in proposing that toast in another place, declared that it was his glory and pride to have been present at the birth of such a noble institution; and when such was the feeling of that great statesman, who accomplished such vast changes in the financial system of this country as to produce a temporary paralysis in agriculture; and when another eminent statesman, the late Lord Spencer, so nobly fostered and supported the society during the early part of its career, considering, no doubt that the best interests of his country were promoted by the advancement of agriculture, in the pursuit of which he passed so much of his own time, and found, as he declared, some of the greatest pleasures of his existence—when such were the views of those distinguished men, he (Mr. Tuxford) might well be proud of the opportunity then afforded to him of proposing continued prosperity to the society. He was delighted also to see so many noblemen and gentlemen devoting themselves, in connection with that society, to the cause of agricultural progress, not in any narrow class spirit, but with a patriotic desire to assist in feeding a growing population, and supplying a nation's wants (cheers). To accomplish such an object to the fullest extent, it was of course essential that reforms and improvements should be gradually introduced into the executive and management. Where, indeed, should they find a constitution or machinery that was perfect? (Hear, hear). The stimulus which had been given to agriculture during the last five-and-twenty years, through the medium of that society, had produced more fruit than had resulted from the operations of any other institution. Moreover, the beneficial effects were not confined to our own shores—they extended to distant countries. In fact, it was not too much to ascribe universality of character to the proceedings of that great society of which he was speaking (Hear, hear). Hence it was that the awards of the judges were of such vast importance; hence it was that intelligence and integrity on their part were so indispensable. The decisions pronounced in the show-yard exercised a powerful influence, not merely in our numerous colonies, but throughout the civilized world. When a particular breed of animals had an adjudication in its favour, there was abroad as well as at home in the colonies as well as in the mother-country, intense anxiety to possess it; and, in like manner, let an implement be stamped with the approval of the society, and that approval was regarded far and wide, and especially in our colonial empire, as a sign-manual of excellence (Hear, hear). Hence the society, though concerned with agriculture alone, gave indirectly a powerful impetus to trade, and created a demand for stock and machinery

which it was sometimes almost impossible to meet. (Hear, hear). In conclusion, he would express a hope that those who took a leading part in the Royal Agricultural Society would continue their useful efforts on its behalf, and that at the close of their career, before they were gathered to their fathers, they would have the satisfaction of knowing that the society had lost nothing in their hands, but that, as good stewards, they had left the estate better than they found it (Cheers).

Mr. ROBERT SMITH replied, as one of the Council of the Royal Agricultural Society. The next toast was "The Butchers," but, as usual, it passed unacknowledged.

Mr. SIDNEY, in proposing "The labourers," said the interest now generally felt in the condition of the labourer had been illustrated that week at the Central Farmers' Club, where the question had been ably introduced and earnestly discussed. It was highly important that in the improvement and elevation of society in general the labourer should not be forgotten. Time did not permit him to enter into the question at length, but he was sure all present felt a deep interest in the amelioration of the condition of the labouring classes, and more particularly of those who were engaged in cultivating the soil.

Mr. EATON felt glad to have an opportunity of returning thanks, as, without this important class, agriculture would be at a standstill. He then proceeded to give some account of the effect of an agricultural society at the Cape of Good Hope, and of his own fifteen years' experience there as an agriculturist. It took five years to gain sufficient experience to make ends meet: the first two were spent with a large practical farmer, and during the others, which were on his own account, he lost £700; but that sum bought that experience which led to his subsequent prosperity. About fifteen years ago there were comparatively few English farm implements in the colony. The labour was unadapted for machinery or implements requiring careful usage; and an agricultural society was only kept alive by the indefatigable perseverance and assistance of some few, amongst whom was one of its most staunch friends throughout, Mr. T. B. Bayley (nephew to the late Mr. Butterworth Bayley), who imported thorough-bred horses, sheep, and other stock to a very large extent. The colony reaped rich harvests from these and similar importations. Wool is now exported largely; and, during the mutiny in India, the Cape supplied upwards of 6,000 horses, which had been very highly spoken of in India. About thirteen years ago Mr. Bayley imported a few of Howard's double-furrowed ploughs, one of which he (Mr. Eaton) used that season, as well as an American and the old clumsy Dutch plough, which required eight horses. He need not mention the result; but still the Dutch farmers were so prejudiced in favour of their fathers' and grandfathers' ploughs, that it took years for them to see their own interest; but the ploughing matches were too convincing, and now his (Mr. Eaton's) agents alone had imported upwards of a thousand of Howard's, besides many from Ransome. With regard to thrashing machines, which were almost unknown to most of the Dutch a few years ago, a trial of the few there had the effect of causing the farmers to come forward to order machines and join the society, and now they were becoming quite general. These improvements had also convinced them of the value of improved labour; and now our Parliament has granted £150,000 for the importation of labour of that sort. Men with inclination to drink had better stay at home, as the Cape wine was cheap, wants few, wages good, and labour always in demand; but those who went, determined to resist this temptation, might work with the pleasant prospect of themselves becoming masters of comfortable homes in a few years. Mr. Eaton concluded by expressing his desire to learn more as to stall-feeding, which he thought ere long must be adopted in the colony.

THE CHAIRMAN then gave "The Visitors," with which the proceedings terminated.

MEETING OF THE MEMBERS OF THE SMITHFIELD CLUB.

HELD IN THE YARD DURING THE SHOW WEEK.

TUESDAY, DEC. 11TH.

The Earl of Hardwicke, as senior Vice-president, occupied

the chair, and said he did so temporarily until the Club elected a successor to their late excellent and lamented president, the Duke of Richmond.

Previous to the usual business, the following resolution was passed: "That this meeting desires to record its deep regret at the irreparable loss the Club has sustained by the decease of its late president, his Grace the Duke of Richmond, K.G., who had during a number of years given the greatest attention to further the objects and promote its prosperity"—and "that a copy of the above resolution be forwarded to his Grace's family."

Mr. TORR then proposed, "That the president in future be elected for a term of one, two, or three years, as the Club may determine, and that the said president be not eligible for re-election for the term of three years."

It was moved by Lord Feversham that the term be for three years; but the resolution was carried for the term of one year, and Lord Berners having been elected president for the ensuing year, the Earl of Hardwicke vacated, and Lord Berners assumed the chair.

The Vice-presidents for the past year, the Marquis of Huntley, the Earl of Hardwicke, the Earl of Yarborough, Lord Feversham, Lord Walsingham, and Mr. C. T. Tower, were re-elected; and Earl Spencer, Lord Berwick, the Hon. Colonel Hood, the Earl of Leicester, and the present Duke of Richmond added to their number.

Mr. Charles Barnett, Mr. Thos. Greetham, and Mr. Samuel Druce were elected trustees.

Mr. Brandreth Gibbs was re-elected Hon. Secretary.

Mr. Samuel Anstey, of Manabilly, Fowey, Cornwall, was elected a steward of the yard for cattle, long-wool sheep, and pigs in the room of Mr. Quartly; and Mr. Thurnall, of Royston, Herts, for short-wool and cross-bred sheep, in the room of Mr. H. Waters.

Mr. TORR moved a resolution for a general revision of the prize sheet. The motion was carried, and a committee appointed to make the revision and report.

Mr. THURNALL'S motion—"That all exhibitors of cross-bred animals shall be required to specify the exact nature of the cross, that is the breed of sire and dam respectively, and whether the animal exhibited is the result of a first or more remote cross,"—was carried.

Mr. BARFORD'S motion, "That in future any sheep that may be exhibited for any prize offered by the Club shall not be in any way clipped or trimmed (except on the head and legs), and any sheep so clipped or trimmed shall be disqualified,"—was negatived.

Thirty-six new members were elected.

THURSDAY, DEC. 13TH.

LORD BERNERS in the chair.

Authority was given to late trustees to take the necessary steps to transfer the stock to the new trustees.

The following recommendation of the prize-sheet committee was unanimously adopted:

"To add third prizes for heifers in the Devon, Shorthorn, and Hereford divisions; third prize in each class of Sussex cattle; third prize in the steer and ox classes of cross-bred cattle; second prize for cross-bred heifers; third prize for light weight short-wooled sheep; and third prize in each of the pig classes."

The foregoing additions to the classes already in existence amount to £208.

The following new divisions and classes were added:

KENTISH OR ROMNEY MARSH SHEEP: Wethers of any age—first prize £10, silver medal to breeder; second prize £5.

SHROPSHIRE SHEEP: Wethers one-year-old, under 22 months—first prize £15, and silver medal to breeder; second prize £5. Wethers two years old, above 22 and under 34 months—first prize £15, and silver medal to breeder; second prize £5.

MOUNTAIN SHEEP: Wethers of any age—first prize £15, and silver medal to breeder; second prize £10; third prize £5.

IN EXTRA STOCK, a new medal for short-wools not South-downs; and a new medal for long-wools not Leicesters.

The total increase to the prizes is about £300 per annum, making a total of £1,500.

Mr. FISHER HOBBS moved, and Mr. JONAS WEBB seconded the following resolution, which was carried unanimously: "That the president be requested to call a general meeting of the members of the Club in the month of May, for the purpose of the appointment of a president for the ensuing year, for the election of new members, and for other general business."

It was arranged that this meeting should be held on the 22nd of May, the same day as the half-yearly meeting of the Royal Agricultural Society.

On the motion of Mr. STOKES, Mr. Faulkner, the steward of Lady Chesterfield was called in respecting the pen of pigs disqualified, after an examination by Professor Simonds, as not being of the same litter, and two of them as above the age. Mr. Faulkner said in explanation, that he was prepared to swear from his own book and that of the pigman, that the pigs in question were all of one litter, and within the age. It was, therefore, resolved to refer the matter to the stewards of the yard, with power for them to decide in accordance with the evidence adduced.

Professor Simonds was not present.

Mr. STOKES gave notice that he should move at the next meeting, that the former rule of the Club, as to the disqualification of entries, should be reverted to.

No books being produced to authenticate the age of the Devon steer, the disqualification was confirmed.

Thirteen new members were elected.

METROPOLITAN CATTLE MARKET.

THE GREAT DAY.

LONDON, MONDAY, DECEMBER 17.

The unusually high prices at which all kinds of really prime stock have been selling during nearly the whole of the present year, induced the opinion in more than one quarter that the show here, to-day, for Christmas consumption would be an unusually good one, and, as to number, considerably in excess of some previous corresponding periods, the scarcity of really good food in most parts of the country notwithstanding. In some respects, this impression was well grounded; but we confess that this has *not* proved the best exhibition of its kind held in the metropolis. In the first place we may remark that there was an unusually large number of young animals shown; and, in the second, that the

merits of some of the older stock were not equal to last year. High quotations for Beef, the result of a great increase in the consumption of food, have, of course, stimulated production to an extent, beyond which it would seem scarcely safe for the general community. True, it may be more profitable to "force rather than feed," so far as the graziers' interests are concerned; but the question yet to be solved is—are we really progressing in the right direction? It would, of course, be unjust to condemn the system of crossing, if not carried too far, because crosses between the Scots and Shorthorns were exhibited here this morning, which equalled in weight, quality, and symmetry the purest

Scots, Devons, and Herefords; indeed, we may say, without hesitation, that they were full of the best butcher's points. Without, therefore, condemning the system, which no doubt has proved a most profitable one to those who have carried it out successfully, let us hope that eventually it will not leave consumption dependent upon a mongrel supply of stock. The crosses, then, brought forward on this occasion formed no unimportant portion of the show. Next in order to this particular description of stock we may place the Shorthorns. Amongst them we observed scarcely any inferior animals; indeed, we may observe that in number they were very large, and that their condition was, if anything, superior to the supply on offer in 1859. Perhaps, however, Lincolnshire has this season suffered less from want of pasture food than in the previous year. In considering the Herefords, we may observe that, though there was a fair number of really useful Beasts among them, we observed a falling off in their general weight and condition. This is to be regretted, because all must be aware, in this progressive age, of the great importance of keeping up the pure blood of the country. As regards the Devons, nearly the same observations may be applied to them; but how is it that Devonshire should of late years fall short of its usual amount of supply? Are higher prices realized at home than in this market? or do the graziers think it more profitable to sell month by month, rather than forward a large number of Beasts to London on one particular occasion? We cannot presume otherwise than that there are now more beasts disposed of in the country than in many past years; hence the deficiency here to-day. We feel gratified in being able to state that the show of Sussex beasts—most of them being of noble proportions, but, perhaps, rather too old for general purposes, though they carried an immense supply of good consumable food—was larger than during the last five years. This, we may observe, is an important point gained from the now distinctive, but not over-liberal, premiums offered by the Smithfield Club. If we mistake not, Sussex will annually, with a fair field before it, produce far greater wonders than were shown on the present occasion. On a close examination of the Scots, whether Aberdeenshires or West Highlanders, we must admit that they were never excelled. Those forwarded to Messrs. Maidwell and Slayland (27 in number) and those to Mr. John Lamsden (10 in number), by Mr. William M'Combie, of Tillyfour, Aberdeenshire, were some of the best we have ever seen. But why did not Mr. M'Combie allow his noble animals to grace the show yard in Baker-street? Their value might not have been enhanced by the change in the place of exhibition; but certainly we should have been more pleased to have seen them there than in the open market. The show of Scots and crosses from Norfolk was an unusually good one. It comprised stock of fine symmetry, great weight, but of very moderate age. There were very few polled beasts from that or the adjoining county—Suffolk. The Welsh runts, though few in number, were in unusually prime condition, consequently realized high quotations. As regards other kinds, from various parts of England, we may observe that they were, for the most part, in but middling condition. There was a full average number of Irish beasts on offer *via* Liverpool. Some of them were well made up; but, generally speaking, they did not come up to some former shows. We observed amongst them several crosses, evidently with the shorthorns.

The following returns show the number of beasts exhibited, and the prices realized for them, on the great days in the last nineteen years:—

Years.	Beasts Shown.	Prices.		
		s.	d.	s. d.
1841	4,509	3	8	5 0
1842	4,541	3	4	4 8
1843	4,510	2	8	4 4
1844	5,713	4	0	4 6
1845	5,326	3	6	4 8
1846	4,570	4	0	5 8
1847	4,282	3	4	4 8
1848	5,942	3	4	4 8
1849	5,765	3	4	4 6
1850	6,341	3	0	3 10
1851	6,103	2	8	4 2
1852	6,271	2	8	4 0
1853	7,037	3	2	4 10
1854	6,181	3	6	5 4
1855	7,000	3	8	4 2
1856	6,748	3	4	5 0
1857	6,856	3	4	4 8
1858	6,424	3	4	5 0
1859	7,560	3	6	5 4

On Mr. Robert Morgan's stand, we observed some very fine Beasts from Norfolk, the property of Mr. Lads, Mr. Felton, Mr. Freeman, and Mr. Farrar; from Scotland, the property of Mr. Mitchell, Mr. Stodart, Mr. Kidd, and Mr. Garden; from the midland counties, Mr. Morgan had, likewise, some very good stock.

Messrs. Giblett and Son had on offer about 30 extraordinary fine Norfolk Beasts, belonging to Messrs. Wortley; also some fine Scotch Beasts from Messrs. Stewart, Martin, and Mennie, which, although smaller than usual, were of very inferior quality.

Mr. George Dickson had an excellent stand of Scotch-fed Beasts from the counties of Aberdeen, Banff, Kincardine, and Inverness. They were the respective property of Messrs. Martin, Knowles, Thomson, Kidd, Bruce, Longmore, Stodart, Smart, Frost, Shand, Wishart, Mitchell, Thorn, and other Scotch graziers.

Mr. William Collins had a very fine show of Beasts, forwarded by Mr. W. Shaw, Far Cotton, Northamptonshire; Mr. Owen Wallis, of Overstone, Northamptonshire; Mr. James Attenborough; Mr. Overman, of Egmore; and Mr. John Hudson, of Castle Acre. Mr. Collins had, likewise, some remarkably good Devons, belonging to Mr. T. S. Moore, of Warham.

Mr. Senior exhibited 40 very prime Devons, and which were, perhaps, the best exhibited in the market. Some of them were of great weight.

Several other graziers had on offer some superior stock; but that on offer from Sir Charles Knightley's breed was not equal to most former years.

The show of Sheep was by no means a good one, either as respects numbers or quality. Messrs. Weale had a good show of Sheep, belonging to Messrs. Oakley, White, Senior, Rowland, &c.; also several lots from Oxon and Berks.

Messrs. Eland and Son, Mr. Hancock, and other graziers had some fine specimens of the Lincolnshire long-wooled breed.

Mr. Thomas Dodds exhibited some very good Down and Half-bred Sheep, belonging to Mr. Franklin, of Wallingford; Mr. Readings, of Caversham; and Mr. Dodd, of Chickendon, Oxon. Mr. Collins exhibited some remarkably fine cross-bred Sheep.

STATE OF THE TRADE.

The number of Beasts here to-day being unusually large, the demand for most kinds was by no means active. However, the prime breeds were in fair request at somewhat high currencies. A few very superior Scots, &c., realized 5s. 6d. per 8lbs., but the general top figure for Beef was 5s. 4d. per 8lbs.

From Norfolk, Suffolk, Essex, and Cambridgeshire we received 3,200 Scots, &c.; from Lincolnshire, &c.;

2,300 Shorthorns; from Devonshire, 800 Devons; from other parts of England, 1,000 various breeds; from Scotland, 700 Scots and Crosses; and from Ireland, 350 Oxen, &c.

There was a moderate show of Sheep. The best breeds moved off steadily, and in some instances prices had an upward tendency, a few very fine Downes having sold at 6s. per 8lbs., otherwise the Mutton trade was inactive, but at full prices.

There were a few Lambs on show, but in very poor condition.

We were fairly supplied with Calves. Prime Veal was rather dearer, otherwise the trade was rather heavy.

The demand for Pigs was steady, and in some instances prices were a shade higher.

The total imports of foreign stock into London last week amounted to 4,525 head. In the corresponding period in 1859 we received 4,364; in 1858, 5,734; and in 1857, 1,896; in 1856, 1,895; in 1855, 4,326; and in 1854, 2,828 head.

IMPORTS INTO LONDON LAST WEEK.

FROM WHENCE.	BEASTS.	SHEEP.	LAMBS.	CALVES.	PIG.
Amsterdam	29	—	—	—	—
Antwerp	—	—	—	28	—
Hambro'	14	302	—	—	—
Harlingen	123	39	—	9	—
Medenblik	28	569	—	—	—
Nieu Diep	25	772	—	—	—
Rotterdam	220	2020	—	218	59
Tonning	60	—	—	—	—
Total ..	499	3702	—	255	59

YEARLY COMPARISON OF WEEKLY IMPORTS.

	BEASTS.	SHEEP.	LAMBS.	CALVES.	PIGS
1859....	678	3424	—	141	121
1858....	555	4756	—	375	48
1857....	318	1473	—	195	—
1856....	485	1193	—	285	12
1855....	783	3529	—	21	—
1854....	1076	1588	—	155	9

PRICES THIS DAY.

Per 8lbs., to sink the offal.

	s. d.	s. d.
Coarse and inferior Beasts	3 4	to 3 8
Second quality ditto	3 10	4 4
Prime large Oxen	4 6	5 0
Prime Scots, &c.	5 2	5 4
Coarse and inferior Sheep	3 8	3 10
Second quality ditto	4 0	4 8
Prime coarse-woolled ditto	4 10	5 4
Prime Southdown ditto	5 6	5 10
Large coarse Calves	4 0	4 6
Prime small ditto	4 8	5 0
Large Hogs	4 0	4 6
Neat small Porkers	4 8	5 2

Suckling Calves, 18s. to 23s.; and Quarter-old store Pigs, 23s. to 30s. each.

HEAD OF CATTLE ON SALE TO-DAY.

[FROM THE BOOKS OF THE CLERK OF THE MARKET.]

TOTAL SUPPLIES.	FOREIGN SUPPLIES.
Beasts	7,860
Sheep	19,550
Calves	210
Pigs	515
Beasts	865
Sheep	5,100
Calves	160
Pigs	—

HEAD OF CATTLE ON SALE LAST THURSDAY.

TOTAL SUPPLIES.	FOREIGN SUPPLIES.
Beasts	1,560
Cows	150
Sheep	3,500
Calves	280
Pigs	320
Beasts	400
Cows	—
Sheep	800
Calves	160
Pigs	—

COMPARISON OF THE GREAT DAYS.

Per 8lbs. to sink the offal.

	Dec. 12, 1859.				Dec. 17, 1860.			
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Coarse and inferior Beasts	3	6	to 3	10	3	4	to 3	8
Second quality do.....	4	0	4	6	3	10	4	4
Prime large oxen	4	8	5	0	4	6	5	0
Prime Scots, &c.	5	2	5	4	5	2	5	4
Coarse and inferior Sheep	3	4	3	10	3	8	3	10
Second quality do.....	4	0	4	4	4	0	4	8
Prime coarse-woolled do.	4	6	4	8	4	10	5	4
Prime Southdown do. ..	5	0	5	4	5	6	5	10
Large coarse Calves	4	2	4	8	4	0	4	6
Prime small do.....	4	10	5	2	4	8	5	0
Large Hogs	3	6	3	10	4	0	4	6
Neat small Porkers	4	0	5	0	4	8	5	2

SUPPLIES ON SALE Dec. 12, 1859. Dec. 17, 1860.

Beasts.....	7,560	7,860
Sheep.....	24,420	19,550
Calves.....	160	210
Pigs	430	155

EXTRAORDINARY NOTICE.—In the Great Smithfield Market, the largest ever known, there were seven thousand eight hundred beasts placed; but yet, more remarkable, there were eight thousand eight hundred "bespoken," a thousand more than the actual number for sale. This announcement at first absolutely paralyzed the trade, and the practice, a bad one, requires looking into by the market authorities.

LADY CHESTERFIELD'S PIGS.

SIR,—For the last four years the Countess of Chesterfield, Bretby Park, Burton-on-Trent, has exhibited pigs at the Birmingham Cattle Show, and each year taken prizes. This year her ladyship decided to show the pigs exhibited at Birmingham also at the London Smithfield Exhibition, and they were entered accordingly. On their arrival at Birmingham they were examined as to age, &c., by Professor Simonds and Mr. Hunt; after which they gained the first prize in their class. The day following the Birmingham Show they were taken to London, and again examined as to age, &c., by the same Professor Simonds, and he there stated that one of the pigs was younger than the other two, and that consequently they could not compete for the prizes, although the judges had selected them for one of the prize pens.

Having had the management of my Lady Chesterfield's farm, I think it my duty to state that the pigs in question were bred on the farm, and there were no other pigs within months of their age. The foreman keeps a book, wherein he enters the birth of the animals, and from this book I enter them for the shows; and I am prepared to prove—upon oath, if required—that the pigs exhibited were all of one litter, and their ages properly described in the certificates for entries.

I have had much experience during the last 25 years in breeding, rearing, and fattening of cattle, sheep, and pigs; and my opinion is that the examination of the mouths of animals is not a safe test as to their age. By being highly fed when young they will very frequently change their teeth, much sooner than when kept in an ordinary way; and I will venture to observe, that although I think it necessary animals should be subjected to certain examinations, when competing at cattle shows, I think no persons are so competent for this as the gentlemen selected as stewards and judges of the shows, who are men of much experience, integrity, and ability.—I am, Sir, &c.,

JOHN FAULKNER,

Agent to the Earl of Chesterfield.

Bretby Farm, Dec. 15, 1860.

[We may add, merely to show the consistency of Mr. Simonds' conduct, that he objected to these pigs at Birmingham, but that the Council there did not act upon his advice.—Ed. F.M.]

ROYAL DUBLIN SOCIETY.

THE WINTER SHOW.

For the long period of 130 years the Dublin Society has been a prominent, and in many respects a useful institution in the sister island. Aided by considerable annual parliamentary grants, it has laboured in "promoting husbandry, and the other useful arts"—being the objects for which it was first established, and in the furtherance of which it has drawn into the ranks of its members a large number of the landed proprietors in Ireland, although not so many as it ought, perhaps, to have. Still they form the bulk of its members, who believe that they are fulfilling at least part of their duty when they have become contributors to its funds.

For many years "the promotion of husbandry" in Ireland formed by far the most important item in the annual accounts of the Society, and large sums were expended in encouraging planting, draining, the introduction of new varieties of plants suitable for the farm and the garden, the improvement of live stock, and in different channels which are now apparently forgotten—not the least important being the maintenance of a veterinary institution, which is now, by the way, sought to be revived, as it ceased about forty years ago, from some causes which are now apparently rather difficult to trace. Although perhaps, this might have originated in a certain indifference to agricultural matters, which has of late increased to a considerable extent in the management of the Society, and which even at that period might have begun to exercise its baneful influence. Be that as it may, certainly the Dublin Society of the present day is not the Dublin Society of sixty years ago. Its liberal premium system has dwindled down to a very small sum, and its Agricultural Committee, instead of occupying, as it ought to do, the foremost place, is shoved into a corner, and its most moderate demands met by a growling non-compliance.

The truth is, Irish country gentlemen generally do not take an active part in the general management of the Society; whilst those who do, are unable to fight against the stronger influence of others, not at all connected with rural affairs, who have crept into the membership and into the management, and who do not consider farming matters "genteel" enough to merit the attention of such *savans* as they fancy themselves to be. They consider, forsooth! that the Dublin Society, founded for the purpose of promoting husbandry, ought to devote its fostering care to "higher branches" than the rearing of bullocks or the management of muck-heaps. Consequently, they intrude into matters with which they have here no concern, but which form the special province of other societies; and to effect this, they first starve, and will ultimately ruin, that department of the Society's operations which is its first concern, unless public opinion steps in to save it.

The spring shows of the Society have for several years been, no doubt, highly successful; but we deny that such success is attributable to encouragement afforded by the Society. It gives, indeed, a convenient place of meeting, and that is nearly all; for the premiums are laughably low, and would not, of themselves, draw together a parcel of common pig-jobbers. But then, breeders find the spring shows admirably suited for enabling them to dispose of their young stock; and hence, at those meetings, there is a turn-out of yearling Shorthorn bulls such as we do not meet with elsewhere. Implement-makers also find the "Leinster Lawn" a first-rate sale-ground; but all that the Society does is to find the ground, for which they charge largely.

For several years the Society has held a winter show of roots and other kinds of farm produce; and, latterly, fat stock have been added. But this department does not thrive; and if it is stifled, the country has the Society to thank for it. The same reasons which lead to a full show of breeding stock in spring, do not hold good in the case of a winter exhibition of fat stock; and the Society has yet to learn that it must offer greater inducements to

feeders than the paltry silver medals which it appears to consider amply sufficient to cause men to put themselves to all the trouble and expense attendant on preparing for, and exhibiting at a show of fat stock. We do not blame the Agricultural Committee, the members of which have ostensibly the power to regulate such matters. They have no such power; and the sooner those who are permitted to exercise a controlling influence over them are sent to the right-about, and made to know their position, and to feel their real insignificance, it will be all the better for the Society, and for Ireland.

We would much rather write in an encouraging than in a disparaging strain, but we have been forced to give expression to the foregoing remarks, from looking over the prize-sheet and catalogue of entries of the Royal Dublin Society's winter show held on Tuesday and Wednesday last. The show of farm produce was perhaps not quite so large as we have seen it in Kildare-street on former occasions, but, considering the nature of the past year, we were surprised to find such a display of really good specimens of roots, and samples of grain. But when we came to the lamentably poor turn-out, in point of numbers, in the stock classes, and when we found to our utter disgust that the pinching economy of the Society could not afford to have a poultry show at all this year, we saw quite enough to convince us that if ever a society deserved to be spoken of in very plain terms, the Royal Dublin richly merits a most unsparing use of the whip. If it was the case that the funds of the Society were at a lamentably low ebb, or if its agricultural exhibitions were a losing concern, then there would be some excuse to offer; but there are plenty of funds—if, indeed, these were not frittered away, or to speak with greater correctness, lavished on other matters, the beneficial results of which are at best but questionable. Further, the shows are very nearly self-supporting, even without the adventitious aid of balls and "banquets," which other Royals call to their assistance in swelling out the receipts on such occasions, and notwithstanding what is we believe the case, that the numerous members of the Society have, in virtue of their membership, the right of entry to its shows "free, gratis, and for nothing." At present, however, we will not pursue this subject further; but as we find our Irish contemporary *The Farmers' Gazette* complaining of matters which we have glanced at, we are glad to give a helping hand in endeavouring to place the Society in its true position, and to enable it to become of as great utility to the country as it unquestionably was at an earlier period in its history.

On comparing the show of this with that of last year, we observed a considerable decrease in numbers, which was no doubt attributable to the Society having curtailed its premium-sheet this year to the extent of seven classes in the fat cattle, three classes of fat sheep, and three classes of fat swine. At this time, however, the Society had a new prize to offer, in the shape of a 50-guinea cup, presented by the Messrs. Ferguson, Dublin, and intended to be given for the best fat animal in the show irrespective of age, sex, or breed. The cup to be challenged every year until won three years in succession by the same individual.

Mr. Allan Pollok, the energetic proprietor of the Lismanally Estates, near Ballinasloe, was the owner of two-thirds of the fat cattle exhibited, and carried off the lion's share of the prizes, which was owing not so much to the number of his entries as to their real merit, and infinite superiority to anything else brought forward. Heading the list with a very fair two-and-a-half-year old Shorthorn ox, he followed in the next class with one of the same breed, a son of Towneley's Valiant, to which was awarded not only his class prize, but also the challenge cup—an honour, however, which we daresay should have been won by "a horse of another colour," one of Mr. Pollok's lot of two-and-a-half-year-old heifers—crosses of the Galloway with the Shorthorn, and

which for compactness, completeness of finish, and general perfection would have stood the test in any exhibition in the kingdom. She missed the cup in consequence of a little oversight on the part of the judges, which they afterwards frankly acknowledged; but considering that "one man was owner of both, the cross-bred lady could say to her big cup-winning half-brother, "It's not lost what a friend gets." Mr. Pollok's cross heifers were altogether not only beautiful specimens as regards symmetry, but each of them had turned their allowance of cake and roots to the best account. His West Highlands also were, as usual, very fine; but his superb four-and-a-half-year-old heifer of that breed was the attraction in many respects of the show. She passes into the hands of a Glasgow butcher, when her beautiful joints will furnish the boards of "sons worthy of their sires"—those undegenerate epicures, the modern Bailie Nicol Jarvies, whilst her magnificent head and horns will grace the hall of Lismanny House.

The principal prize takers in the other classes were Mr. William S. Garnett with an aged Shorthorn cow, not too good in her loin; Mr. Barton with another aged, large sized, but rather coarse cow; and a very well-finished Shorthorn three-year-old heifer, promising "cut and come again" in her ribs and rumps. Mr. Samuel Garnett showed one of those nice little Kerries, which are to be met with occasionally in Ireland. She was only 38 inches in height at the shoulders, but girthed 70 inches.

The sheep pens were tolerably filled, considering the general character of the show, but the quality ought to have been better. Mr. Pollok was the winner of the first prizes in all the long-wooled wedder classes, whilst Mr. Cotton and Dr. Radcliffe followed, along with Mr. Pollok in one class, as the second winners. Their sheep were merely gross fed, and only in moderate condition. In long-wooled ewes Mr. Owen, Blessinton, was the winner of the first prize, with a pen of his fine Pawlett ewes, in splendid condition. The second pen, belonging to Lord Talbot de Malahide, was also good, but unequal. The short-wooled wedders, Downs and Shropshires, belonging to Mr. Tuite, were in fair order, useful mutton, and nothing more, but Mr. P. Broughton's Shropshire ewes were very good, heavy weathers, and full of flesh and fat. A pen of large Ballinasloe wedders over three-and-a-half years old, which were curiously enough entered as "short-wooled," belonging to Mr. Gerrard, got the prize in the class made up of "six sheep, of any age, sex, or breed, not competing in the fore-going classes," in which class a pen of exceedingly useful and profitable sheep was exhibited by Mr. Naper. These sheep, crosses of the small Scotch blackfaced ewes with the Shropshire ram were 2½ years old, and in capital condition. This cross evidently succeeds well, and we make the remark in order to bring it under the notice of North-country friends.

Mr. Chapman, Maynooth, was the principal exhibitor of fat swine, his breed being the Windsor, and the specimens he brought forward were handsome, well-fattened pigs. Mr. Bruce's large Yorkshire got first prize in her class, and during the two years of her existence has proved to be a very useful, thrifty animal. She was very heavy, and we suppose her prize-taking career is now at an end. Lord Talbot de Malahide had also a thoroughly fat Berkshire, but beyond these animals there was nothing worthy of special notice amongst the fat swine.

The show of roots and general farm produce was, as we have stated, surprisingly good, especially when the nature of the season is taken into account. Some of the samples of grain showed a little rawness, but on the whole in a much less degree than could have been anticipated. The first prize white wheat, grown by Mr. O'Reilly Dease, weighed 61lbs. per bushel, and the first prize red wheat, grown by Mr. Mills, Donabate, weighed 61½lbs. The first prize barley, very fine quality (Mr. Trim), weighed 57lbs. The first prize white oats (Mr. O'Reilly Dease) weighed 44½lbs.; and Major Cunningham's first prize black oats, 40½lbs. per bushel. Mr. Chapman, Maynooth, was the winner both for beans and peas, the former weighing 65½lbs., and the latter 60½lbs. per bushel.

Passing over the minor classes, we find Mr. Forrest's six roots, long red mangel, weighed 68lbs.; six roots long yellow mangel, grown by the same gentleman, 70lbs.; his six roots red globe mangel, 65lbs.; and his six roots yellow globe mangel, 68lbs. Mr. Forrest was thus the winner of the first prizes in all the sections of mangels.

Twelve roots of carrots were exhibited in each lot, and the first prize for red or Altringham was awarded to Mr. Cosby's lot, weighing 27lbs.; a heavier lot, shown by Lord Talbot de Malahide, weighing 33lbs., being placed second, on account of a slighter degree of coarseness in the roots. The same thing took place in the white Belgian carrots, Mr. Cosby's lot, weighing 29lbs., being placed above Mr. Brennan's weighing 32lbs. Mr. Forrest's prize twelve parsnips weighed 27lbs., but another lot belonging to Dr. Radcliffe, which although entered did not reach the hall until the adjudication was over weighed 35lbs.

The show of turnips in the different sections was well filled, the first prize for swedes being awarded to Mr. Robert Shaw, Redmont Hill, Co. Galway, an extensive farmer on Mr. Pollok's estate: his six swedes weighed 94lbs., beating his landlord's lot, which was placed second, and which weighed 71lbs.; but Dr. Radcliffe's lot, which arrived too late, was heavier than either, being 119lbs. Mr. Pollok got the first prize for Aberdeen turnips, his six roots weighing 86lbs. The best four white cabbages, grown by Mr. Watkins, weighed 150lbs.

The show of flax fibre is never large at the Dublin shows, and the prizes in this class were, as usual, carried off by a very enterprising and regular competitor, Mr. Patten, Co. Monaghan. Dr. Taylor, Newton Mount Kennedy, got prizes for some good samples of hemp, raw and prepared; and the same gentleman showed two half-trusses of beautifully saved hay, which had retained the natural colour of the grasses in a remarkable manner.

The butter show was not extensive, but samples were very fair. Mr. Patten got the first prize, and Mr. Chaloner the second; the latter gentleman being the only exhibitor of Irish cheese, an article which is not made to any extent in Ireland.

Dr. Taylor was the only competitor in wools; but there was a large exhibition of Irish friezes manufactured by exhibitors.

There were several collections of farm produce sent by one exhibitor, the largest and most varied, and therefore the winning collection, being that which was sent by Mr. Pollok, representing the crops grown on 3,000 acres. Lord Charlemont's collection was also large, varied, and good; but for some years past his lordship's name has not appeared as a competitor, his veteran manager, Mr. Brady, having more silver medals than he knows what to do with.

Public institutions compete in a separate class at the shows of the Royal Dublin Society; the entries in this class, in the order of merit, being the Guardians of the North Dublin Union Workhouse, the Guardians of the South Dublin Union, and the Guardians of the Tullamore Union. The collections sent from these institutions were very good, and representing a good principle, that of turning juvenile pauper labour to a profitable account, were, perhaps, not the least interesting part of the exhibition. But strange to say, not a turnip, nor a cabbage, nor a pig, nor a single specimen of any description was sent from any of the pampered model farms of the National Board, the maintenance of which costs the country such immense sums. We advise our M.P.s. to look at this significant fact, and consider it well, before voting large grants of the public money for the support of institutions which have not even a big turnip to produce as evidence of their value or vitality.

The Winter Show of the Royal Dublin Society cannot of course be regarded as an implement exhibition; but it is growing in this respect, and every available inch of room was taken up. Edmondson (Dublin) exhibited Ransomes and Sims' and Bental's implements and machines, consisting of ploughs, cultivators, oatmills, chaffcutters, oilcake-breakers, root-cutters, and root-pulpers. John Maguire (Dublin) had a large collection of a similar kind. Bradford was great in his celebrated washing-machines and mangles, which are universal favourites in Ireland. Toole and Co. represented Thorley; Banks (Liverpool) hurdles, sheep-racks, and chaffing-machines; Ritchie (Ardee) corn-drills, and ploughs; Miller (Dunbar) ploughs and grubbers; Perry (Glasgow) sheep-racks; J. B. Lawes—represented by his new Irish agent, James Rutherford—superphosphate, barley-manure, nitrate of soda, and decorated cotton-cake, for the last of which there was a regular run upon his stand; W. Drummond and Sons (Dublin and Stirling) a varied collection of root-pulpers, oilcake-breakers, turnip-slicers, sheep racks, and sheep-nets; Perry (Dublin) artificial manures; McKenzie (Cork) portable cattle, sheep, poultry, game, and rabbit fencing, made by M'Pher-

son's premium apparatus, so well known at the shows of the Highland and Agricultural Society, the Glasgow Society, the Manchester and Liverpool Society, and the Royal Irish Agricultural Society. Garrett and Son sent their 4-horse portable steam-engine, and their corn-preparing machines for steam and hand-power; Keenan (Dublin) various implements, root-pulpers, chaff-cutters, apparatus for blasting roots, &c., &c.; Richmond, Chandler, and Norton (Liverpool), chaff-cutters,

corn-crushers, turnip cutters, pulpers, and haymaking machines; Noble (Chapelizod) drills, &c.; Shekleton (Dundalk) land-pressers, turnip-cutters, &c.; Saunders (Dublin) steaming apparatus; Barrett, Exall, and Andrews portable engines and thrashing machines; Dickson, Hogg, and Robertson (Dublin) a beautiful and extensive collection of seeds, roots, and magnificent conifers.

THE NORTHERN COUNTIES FAT-STOCK AND POULTRY SHOW.

The Northern Counties Fat Stock and Poultry Society, hitherto known as the "South Durham and North Yorkshire," held its eighth annual exhibition in Darlington, on the Wednesday, Thursday, and Friday preceeding the Smithfield week. It proved to be, what it was fully expected to be, by far the best show ever held, not only by the society, but in the north of England, for not merely were the entries more numerous (although a material decrease was exhibited in the number of cattle), but they were greatly superior in quality. The following is a comparative statement of the number of entries for the latter years of the society:—

	1855.	1856.	1857.	1858.	1859.	1860.
Cattle.....	75	73	78	66	81	51
Sheep.....	27	16	14	12	21	20
Pigs.....	14	21	22	33	32	44
Poultry.....	403	477	377	480	339	471

Thus showing, as compared with last year, a falling off of 30 in cattle, and 1 in sheep, and an increase of 12 in pigs, and 132 in poultry.

The chief attraction of this show, and why we more particularly notice it, is the superior class of shorthorns which it is the means of bringing together. This very excellent and deservedly popular breed, in its early history, was known as the "Tees Water"; latterly the "Durham," or "Shorthorn." Of the dozen different breeds and sorts of beasts in this country, one third, we are told, are composed of Shorthorns. They are the most widely spread of any other, their popularity being confined not only to our own island, but extending also to the four quarters of the globe. Where, then, they are admitted to be indigenous to the soil, as is said to be the case with Darlington and the neighbourhood, or the Vale of the Tees, it is most likely that we shall find the choicest specimens. And it be remembered that in this district there are many as great admirers of this species of animal as was ever Mr. Collins, to whose anxious devotion and care we owe so much. Last year the Duke of Cleveland exhibited an ox which had it been shown at the Smithfield Club or Birmingham would, it was generally asserted, and that by most competent judges, have taken the shine out of those which obtained the chief honours. This year, although perhaps there was not one to equal in bulk that of the Duke of Cleveland's, there were many noble animals, and, as a whole, their quality was vastly superior to those shown last year. A heifer, the property of Mr. Booth, of Warlaby, near North-allerton, called the "Soldier's Bride," which was declared to be the best animal in the yard, and thereby won the "Founder's Cup;" a gold challenge vase, valued at 100 guineas, given by Mr. Mewburn, jun., a silver cup, given by the tradesmen and innkeepers of Darlington, and £15, as the best in her class, was only one year eleven months and three days old, and yet she weighed, it was estimated, dead weight, not less, perhaps more than 70 stones. Such an instance of early maturity, we believe, is not on record. Her symmetry was perfection itself, her back level as a board, and quarters exceedingly good; so with loins, ribs, and shoulders; the beast could not be excelled, and her rump had the appearance of two fangs. Her flesh was particularly mellow to the touch, and her coat, white in colour, was almost as fine as silk. A thousand guineas is said to be about her figure. She was the observed of all observers; it was extremely difficult to get a glimpse of her, the stall being surrounded with spectators during the whole of the exhibition. She won a silver tankard at York the other day, on the occasion of a fat cattle show being held in that city. Providing

she be kept for a couple of years more (and, as she is intended for breeding purposes, doubtless this will be the case) competent judges hesitate not to say that she will win all before her. We shall expect to find her at Birmingham or Smithfield next year. Mr. Outhwaite, of Baines, exhibited a prime heifer, Her only failing was in her thighs, which were rather light. She was exceedingly fine in the bone; this, in our opinion, detracted from her symmetry, for she was a heavy, big beast. She was rather aged, but nevertheless had attained marvellous maturity. You could comfortably dine off her back, which was extremely level and broad. Her hair was fine and smooth, and she had the appearance of having been carefully tended. Mr. Gell, of Grimston Hill, near York, who the year before last carried away the Founder's Cup, and has been a successful exhibitor at most of the shows of the society, had a very fat ox under four years, which won the first prize in his class. His proportions were exceedingly good, and his lines were well defined, but he was hardly firm enough in flesh. Mr. Johnson, of Cleasby, closely followed on his heels, coming in second with an animal which, although not perfect, his sides being rather slack, possessed a very good shoulder and breast. Mr. Stowell's, of Favoredale, a great rough beast, was defective in symmetry, but will cut up profitably. Mr. Raine's (of Snow Hall) was misplaced, having been placed amongst the shorthorns, whereas he was a cross. He was a most powerful looking animal, and with a little longer keeping will doubtless make excellent beef. Amongst the shorthorn oxen not exceeding three years old the best was that of Mr. John Hamilton, a very level beast, finely proportioned, and possessing a rare breast, thigh, and hock. Indeed, he promises to be a "topper." Mr. Kay, of Forcett Valley, deservedly obtained a footing in this class. The quality was good, and as to most of his parts there could not be an objection raised, although he failed in one or two points. In the shorthorn heifer class, not exceeding four years, Mr. Outhwaite wins the chief laurel with the animal already alluded to, Mr. Booth coming in second with the Queen of the Isles, a heifer well known to breeders generally, she having been successful at most of the principal shows during the last year or two. At Chester, on the occasion of the Royal Agricultural Society's Show there, she beat twenty-five competitors; and if we mistake not, she was in a very good position at the Great Yorkshire Agricultural Show. Mr. Booth is also successful in the shorthorn heifers, not exceeding three years old, Messrs. Bolckow and Vaughan, the great ironmasters in Cleveland, who of late have evinced a warm interest in the breeding and rearing of cattle, taking the second place, with a one year and two months heifer, most particularly mellow in flesh, and nicely got up. The best cross-bred fat ox, under four years, was that of Messrs. James and William Martin, of Guthrie Castle, Aberdeen; pretty level certainly, but to our mind requiring a little more flesh upon the shoulder. His symmetry was very good, and he was well up in the ribs. Mr. Thomas, of Hurworth-on-Tees, was second, with an animal undoubtedly good, but a little wanting between the shoulder and ribs. He possessed a pretty breast, and for a cross-breed was particularly fine in the bone. The best shorthorned cow having produced a living calf was that of Mr. Bamlett, of Heighington, which we thought was a long way short of what we have before seen. Mr. Outhwaite was here again successful, taking the second place with a good old cow. Mr. James Bruce of Huntly, Aberdeen, and Mr. James Stewart, of Aberdeen, take the first and second place respectively for cross-bred oxen under three years, beating the Messrs. Martin and other competitors "hollow." Sir Walter C. Trevelyan, Bart.'s heifer, under four years, cross-bred, was

particularly good in the hind quarters, and in her forequarters was by no means deficient, but her loins were somewhat below the mark. She, however, ranked in her class. Mr. Hill, of Wetherby, obtained the first place in this class with a very handsome beast, particularly noticeable for her thighs and good back. Amongst the Scotch bred oxen the Duke of Cleveland exhibited a splendid animal; it is doubtful whether he could have been beaten at any show, for all his parts were good, and he was in first-rate condition. Sir W. C. Trevelyan and Mr. Outhwaite got first and second place respectively for cross-bred fat cows having produced calves. The condition of both animals was well-conditioned; the one was remarkably good in her ribs and shoulders, and handled, perhaps, as well as any beast in the yard; the other was tolerably good. Before we close our observations we would just mention that the Earl of Carlisle exhibited his "White Rose of Castle Howard," an animal well-known to breeders of stock.

The sheep, which embraced shearlings between the Leicester and Cheviot, and blackfaced, as well as Southdowns, Leicesters proper, and other crossbreds, presented no particular marks of

excellence, although many well-known breeders entered the lists.

The pigs were more numerous, and better than at any previous show; indeed, we question whether they could have been beaten as a whole. One, brought all the way from Halifax, and had won laurels at York, was here beaten by a decidedly superior animal, the property of Messrs. Booth, of Killyerby, near Catterick, nephews of Mr. Booth of Warlaby. With this pig they won not less than £13. It was certainly a prodigious animal, being as good a specimen of obesity as perhaps could be found anywhere.

The show of poultry was little inferior to the Birmingham show. Many birds which had competed there and obtained honours, were here exhibited; in some cases being successful, in others the opposite. Almost every county in England was represented, cages having been sent from all parts.

Altogether the collection was such a one as any town might envy, and justly places the society in the rank they claim, namely, the third in the kingdom.

BERKELEY AND THORNBURY AGRICULTURAL ASSOCIATION.

The first of a series of discussion meetings, appointed to take place alternate months during the winter, at Berkeley and Thornbury, was held at the former town on Wednesday, Dec. 12, which was attended by a very numerous assemblage of the members of the society. Colonel Berkeley, M.P., the president for the current year, was in the chair; and among those present were noticed Major Gaisford, Messrs. O Long, J. Marsh, R. Barton (of Downhame), J. Nicholls, W. Jones (of the Conygre), J. Savage, J. Till, J. W. Wilson, W. Till, S. Young, W. Gaisford, E. Drew, J. H. Cooke, T. T. Pearce, W. Marsh, F. Burnett, J. Gifford, H. Barber, J. Stratford, G. N. Leonard, H. Leonard, W. C. Wetmore, R. Nicholls, S. Harris, J. Gifford, H. Barber, &c., &c. Mr. Harrison, of Frocester Court, had kindly consented to give an introductory address, suitable to the position of this newly-formed but promising association, and nothing could have been more happily conceived or more appropriate to the purpose.

The Chairman introduced Mr. Harrison, who read the following paper:—

Mr. President and Gentlemen: At the request of your committee I proceed to offer you a few introductory remarks on the occasion of this the first meeting for discussion of your association. In undertaking the task, I feel sensibly its importance, and my inability to do it justice; I must therefore claim your indulgence should the observations I have to make appear to fall short of the occasion. It may be well, first of all, to consider the objects of such associations as yours, how far they trench upon those of the larger societies, or whether they do not rather act as nurseries for them. As far I can ascertain, our neighbours in the north and across the Channel were before us in establishing associations for the improvement of agriculture. I find there existed a society in Scotland (now extinct) called the "Society of Improvers in the Knowledge of Agriculture in Scotland," which published its select transactions in 1743. Again, the Royal Dublin Society, for improving husbandry and other useful arts, was incorporated in 1749, but published weekly observations as early as 1739. Your own neighbourhood appears to have taken the initiative in improvement in England, for the "Bath Society for the Encouragement of Agriculture" was founded in 1777. This society we now see in the Bath and West of England, pursuing its steady and improving course as one of the most valuable institutions of the country. Next comes the Highland and Agricultural Society of Scotland, founded in 1784, the Transactions of which are most important. Then follow, in the present century, the Royal Agricultural Society of England, established in 1838, and the Agricultural Society of Ireland, in 1840. From these dates, you will perceive that our greatest society is comparatively of recent origin, whilst large associations, and some similar to yours, existed and were doing good service previous to its formation. No one can for a moment question the pro-

digious strides which have been taken in agricultural improvement since the formation of the Royal Agricultural Society, or the very prominent part which it has played in that improvement. By the large premiums it has offered for the best stock, it has decidedly stimulated the breeders of shorthorns and other cattle to improve their herds. By encouraging the implement makers, those gentlemen have studied the requirements of the agriculturist, and supplied us with such an array of implements for facilitating the cultivation of the land, and the preparation of its produce for market or for consumption by stock, that really of late years pretty much of the profits of the farmer have been expended upon them. By holding its meetings annually in different parts of the country, it enables everyone, without much expense, to see the very best animals and the best implements of the day, and affords an opportunity for new men, like our friend Mr. Bailey, at the Gloucester show, to step in and carry off its prizes, demonstrate that at any rate we are not behind in everything. By the publication of its Journal also, which is admirably calculated to aid in the practical and scientific advancement of agriculture, it does good service to the cause. The greatest care, however, is requisite in the selection of its papers, as they should all be of the highest standard, and thoroughly trustworthy for references. Now it may be argued—and some I know do consider—that the establishment of purely local societies is a retrograde movement; or that if local societies are formed, and obtain a large amount to dispose of in prizes, they should invite the whole country to compete for them. Upon this subject I would offer a few remarks. Your object is local improvement, as the country show aims at more general, and the Royal Agricultural Society at national advance. Each may, I think, work well into the other's hands, and, all combined, prove of decided benefit. The object of your general prizes differs essentially from that of the Royal and other large societies. You wish to excite to emulation and to encourage all in your neighbourhood to improve their herds; but throwing open your prizes to general competition would counteract this object, as, from a feeling that the prizes would be taken away by the professed show-cattle breeders, many would be deterred from entering into competition. Their aim, no doubt, is the general good; but the result of their labours is to encourage a few persons to make a business of improving their stock and getting them up for show, whose profit results from the name they thereby acquire, which enables them to sell their animals at high prices. This object is undoubtedly a good one, and it has tended materially to improve the stock of the country—at any rate as regards symmetry and aptitude to fatten; but, without in the least undervaluing their points, you will, I take it, endeavour to combine them with milk-producing qualities, and will decide this latter by actual tests for several meals at the pail. I am inclined to think there is some risk of our great societies almost doing an injury instead of

good by neglecting this most essential point in the improvement of stock: and local shows like yours, when the milk question is one of the greatest interest, may tend materially to mitigate, if not entirely to correct the mischief. The animals competing for your prizes should not be got up for the occasion, excepting the fat stock, but be taken from the general herd, and, if possible, two or more cows, and not one only, should enter into competition. You will then encourage many, who otherwise might never aim at anything beyond mediocrity, to press forward; and some of those who carry off your prizes will enter their animals at the country show against a larger field, when they may probably learn a lesson that there is plenty of room for improvement in their herd, as the prize-takers again at the country show will in their turn cry small at that of the Royal Agricultural Society. I hope the formation of your society will induce many of the landlords of the neighbourhood to establish upon their home farms herds of shorthorn cattle of first-rate quality, that by selling and letting out their bulls at moderate rates, they may effect a gradual improvement in the stock of their tenantry. This was the plan introduced by the late Earl Ducie, and the marks of his exertions are still visible in the districts around Tortworth and Woodchester. Colonel Kingscote has for some time followed the same laudable practice, and I feel personally indebted to him for it. The right honourable and gallant admiral at your ancient castle is following the same track, and has expressed his determination not to be beaten. This augurs well. Local exhibitions of stock resulting from such encouragement must become exceedingly interesting. One thing, however, should be never lost sight of in establishing these herds, viz., that the animals be useful for the every-day purposes of the farm. The introduction of a highly bred class of shorthorns without good milking properties would be a positive injury to the district, let their pedigrees be ever so famous. Excellent milkers are to be found among pure shorthorn herds, as in the case of Colonel Kingscote's, and it is the introduction of such that should be encouraged. I would suggest that you should offer a few prizes for general competition, of sufficient value to induce some of those who devote their special energies to the improvement of their herd for the purposes of sale and exhibition, to bring their stock to your cattle show, taking care, however, that encouragement is given to those qualities you desire to cultivate in your own stock, and for that purpose cows in milk, and tested as milkers, and bulls, their produce, seems to promise the best result. By this means you will draw annually to your show animals of first-rate class, by which you may compare those exhibited from the locality, and in course of time challenge the country to show against you. I cannot from these considerations agree with those who think yours a retrograde movement. The same argument that I have advanced for offering a prize open to all competitors, at the annual cattle show, holds good also in the ploughing-matches. Whilst you offer prizes for the best ploughing done by servants of the members, and encourage your sons to put their hands to the plough, and become themselves masters of the work they have to superintend, induce also, by the offer of a liberal premium, the best ploughmen in the country to attend your matches, and show your ploughmen the degree of excellence they should arrive at. The advantage of having some ploughing done in the trial field by first-rate ploughmen, with the best ploughs, was evident at several ploughing-matches lately—among others, I believe, at your own. There is one point in which you cannot possibly clash with the larger societies, and in which you have probably the advantage over them; that is in your discussions; these are certainly calculated to do much good, if properly managed. There is no agricultural question upon which we may not all learn something; and if we come determined, freely and dispassionately, to discuss the subject before the meeting, we shall find that the observations and experience of one will throw light upon difficulties which have presented themselves to others, and there will spring up a willing and mutual interchange of ideas, which is the surest road to improvement. Take the case of cheesemaking. How many excellent cheesemakers in this vale have gone to their last home, the secrets of their success being buried with them, or, at the best, left as a legacy to their family! Now this

bump of secretiveness it will be one object of your society to knock out of the heads of all those in whom it is strongly developed, for it is decidedly antagonistic to progress and improvement. The very foundation of your association evidences that you admit improvement is possible; this is the first step towards advancement; and you may depend upon it that as in science those who have attained the highest pinnacle of fame as investigators of nature have ever admitted that they have merely entered the threshold of the unexplored region of wonders beyond, so we shall find cause to admit, as we increase our knowledge of the secret processes of nature ever passing and frequently unobserved around us, that the number of questions we have to ask increase with our enlightenment, and that profit and pleasure will both accompany our search after knowledge. To derive the greatest advantage from discussions, we must throw our prejudices to the winds. We are all too apt to prejudice questions; this frequently arises from not knowing, and perhaps an inability to obtain a knowledge of the facts upon which a conclusion should be arrived at. When a man has given due consideration to a subject, carefully weighing the evidence before him, provided that evidence be good and sufficient, and his judgment sound, the conclusion he arrives at is no longer a mere prejudice, but an opinion, for holding which he can give satisfactory or, at any rate, powerful reasons. Come, then, to the future discussions of this association, stored with arguments to back the view of the subject you desire to enforce, and a mind free to appreciate those offered by others; then will your meetings partake of a judicial character, for so far only as your arguments are sound will your resolutions be worthy of attention. Again, the formation of your society shows a determination to improve; and patronised as it is by the aristocracy and gentry, as well as supported by the tenant farmers, there is every prospect of a most satisfactory result. In the march of improvement all must go hand in hand: if the landlord lags behind, the tenant's energies will be cramped, and the improvements of the former may be rendered comparatively useless by the want of co-operation on the part of the latter. Our business as farmers is to extract from the earth the greatest amount of food that we can for the support of our fellow-subjects; are we, then, doing our utmost to increase the productions of the earth? What are the obstacles in the way of improvement, and how can they be removed? These questions each suggest an increased number of others, which will come on for discussion. The support given you by those who have it in their power to assist you in improvement shows that they are ready and willing to teach you, and that they are really desirous that the march of improvement should be encouraged. Situated as we are in one of the richest, as well as most beautiful parts of England, it is natural to enquire what, as agriculturists, we are doing, or rather what is the land doing? Is its richness being so taken advantage of, that the food it is supplying for our teeming population is in proportion to that richness? or is it the case that some poorer lands are passing this in the race of improvement, and through the greater industry and enterprise of their occupants giving an equal or even greater return for the country's good? This is a subject well worthy the serious consideration of all those interested in this association; in some degree it affects our credit with our fellow-countrymen. Now I cannot hesitate to declare my belief that we are not making the most of our rich and beautiful district. If Mr. Morton is correct in his view of the matter, the value of the produce of the land, if broken up to a considerable extent, would be more than double that which is returned from it when in pasture alone. Without admitting there would be so great a difference as this, I believe that the breaking up of a considerable portion of the poorer pastures would make the farms intrinsically more valuable; would be of immense advantage to the dairy farmer, enabling him as it would, in connexion with convenient buildings, to keep his stock more comfortable than, in many instances, he can at present, whilst it would supply him with some roots for his stock in the winter—no slight advantage, especially in such seasons as this; and not least, while affording more employment it would materially increase the acreage production of the land, to the no small benefit of the community. This question of breaking up some of the poor pastures

I esteem to be well worthy of your serious consideration, and its dispassionate discussion cannot give offence in any quarter. I particularly mention it because, after thorough draining and sufficient buildings, there are few subjects of greater importance. Some farmers there are, I know, who would not if they could break up any of their pastures, and others who would rather not have their land drained. The arguments that may be brought forward in support of these views would be curious and may be instructive, but they must be very strong and very peculiar to convince me. We are most of us very much interested in dairy management, in which of late years several attempts at improvement have been made. A discussion on this will afford much information; indeed, there are very few questions likely to be brought before us, from a due consideration of which I anticipate a greater amount of benefit to the members. From the introduction of Keovil's machine improvement has decidedly been stimulated. The principal lesson it teaches is the importance of extreme gentleness in the manipulation or handling of the curd, especially whilst in its tender condition. The drawing off of the whey through a cork hole near the bottom of the cheese tub, which is an old practice, or by means of a syphon, as more recently introduced in Scotland, is a decided improvement over the old method of lading it out with a bowl, both because the operation is more easily effected, and the curd is much less disturbed. Cocking's apparatus, which is used very successfully by Mr. Harding, of Sanigar and Mr. Rickett's of Cape Hall, Frocester, or the more simple cheese tub used in Scotland, with an outer casing to admit of hot or cold water being poured in, is probably a very great improvement, which might be very advantageously introduced into this district. The mode of preparing the rennet, and the after-management of the cheese, are subjects for most interesting and profitable interchange of ideas. There is undoubtedly very great room for improvement even in our very best dairies, and to prove to you that such is not mere assertion, but really the case, I am permitted by Dr. Voelcker, who is now engaged in an investigation of cheesemaking for the Royal Agricultural Society, to mention a few general results at which he has arrived. The investigation he finds extremely interesting, and he says that it in a great measure confirms the result I arrived at from a study of my own dairy produce (which is appended to a little work, "Morton's Hand-book of Dairy Farming"), viz., that nearly 25 per cent. of the casein and butter which go to form cheese pass off in the whey; in fact that could we completely extract therefrom the whey, where we make three cheeses now we should nearly make four—of course the pigs would suffer; but the cheese would be much more valuable could it be extracted as food for man, than, as now, in the whey for pigs. Dr. Voelcker says, further, he thinks it may be extracted. At any rate it is something gained to know that there is such a loss, and Dr. Voelcker is the man of all others to work the problem out successfully, for he is well known as a most experienced and exact chemist, and I can answer for his being a most patient and pains taking investigator. The results of Dr. Voelcker's experiments will probably show, that as there are very many different methods of cheese-making, so are there amazing differences in the composition of the cheese made. At the end of September he had analyzed forty-eight different cheeses, and he found the quantities of water in them vary as much as 16 per cent., and the maximum quantity about 4-10ths of the whole. He has found as much difference as 16 to 20 per cent. in the quantity of water in the curd, when finally ready to place in the press, and there is little doubt that this great difference considerably affects the quality of the cheese when fit for market. Besides the question of cheese-making and its composition, there are numerous other points calling for investigation, such as the influence of the geological character of the district upon the quantity and quality of the milk, and on the quality of the cheese; also the effect of various artificial manures, compared with each other and farm-yard manure, upon the milk produced from the land to which they are applied. There is, probably, no district in England which affords in so small a compass so favourable an opportunity for such an investigation as that contained within the limits of your association. It would be quite possible to take a cow from farm to farm, and keeping her in abundant pasture, deter-

mine the relative value of the herbage for producing milk grown on more than half of the known geological strata; besides examining the relative value of various manures upon those strata. Such an investigation is quite within the legitimate objects of the Royal Agricultural Society, and a local society like yours may be of essential service in aiding the investigation. It would be desirable to take steps to encourage habits of inquiry and observation among the sons of members. Would it not be well, towards this end, to offer prizes for essays on subjects coming under their daily notice? Apart from the value there might occasionally be in the essays, your money would not be thrown away, if it induced a spirit of thoughtfulness, and a desire for self-improvement among the young. The town in which we are now assembled bears witness to the importance of the observation of apparently trivial points. What an honour to Berkeley that Jenner, whose name will remain endeared on the memory of man so long as the world lasts, was born here! It was here that he pursued his patient investigation. It was here that, notwithstanding the discouragement he received from his professional brethren, and even from his old master the great Dr. Hunter, he brought his investigations, which were to bestow untold blessings on the world, preventing the ravages of the most terrible scourge to which the human race was subject, to the most glorious conclusion. It was here that he was occupied in his anxious labours to diffuse the advantages of his discovery, both at home and abroad, where he was called to his lastbourne; for the purest benevolence, and not ambition, actuated all his labours, and he clung with affection to his native town, loving the lowly and sequestered paths of life—the valley, and not the mountains: with wishes easily satisfied, he did not wish to hold himself up as an object for fortune and for fame. Let then the remembrances of the great Dr. Jenner stimulate every member of this Association to endeavour to be useful in his generation, and to be persevering in his search for information.

Colonel BERKELEY thanked Mr. Harrison for his very able discourse, observing that the attention with which all had listened to it was the surest evidence of the impression it had made on the minds of those present.

Major GAISFORD advocated the giving premiums to farmer's sons for writing essays, and proposed the establishment of a library, which was promptly responded to by Col. Berkeley promising five pounds to commence a subscription list, for the purchase of books.

Several members spoke in approbation of the excellent suggestions of Mr. Harrison, after which a vote of thanks to Col. Berkeley, for his kindness in presiding, was proposed by Major Gaisford.

YORKSHIRE FAT SHOW.

The fourth annual exhibition of this Society was held in the New Cattle Market, York, on Saturday, Dec. 15, and was kept open till last Tuesday. The money and plate given amounted to nearly £300; and the entries, both of stock and poultry, were satisfactory.

The prize for the best ox was awarded to a Shorthorn of Mr. J. Ellison's, Allerton House, near Knaresborough, which was won very cleverly by Mr. D. Repps, of Norton, near Malton. Mr. Booth's once-renowned Queen of the Isles was beaten in her class by a heifer of Lord Feversham's; but her companion, Soldier's Bride, by Windsor, from Campfollower, who is not quite two years old, and in training for the two-year-old heifer classes at the Royal next year, not only won the younger heifer prize, but the president's (Earl Feversham) £20 silver tankard, as the best beast in the yard, as well. Captain Gunter won a special prize, given for the best fat beast fed on food seasoned with Henri's Patent Mixture.

A very excellent pen of three wethers, shown by Mr. E. Riley, of Kipling Cotes, South Dalton, Beverley, very properly received a first prize. Three wethers belonging to Mr. John Wells, Booth Ferry House, showed cross breeding of a class that ought to be more cultivated, viz., between Lincolnshire ewes and Hampshire down rams. A cross between a Cotswold and Leicester was also commended, and the owner of the pen, Mr. H. Bowser, Faxfleet, Howden, received a

second prize as breeder. James Walker, Esq., of Sand Hut-ton, exhibited a capital fine Southdown wether.

The pigs were a fine collection, and mustered in stronger force than last year. Three prize porkers belonging to Mr. Robert Hornsey, of this city, which it will be remembered also gained a prize at the York Pig show, were first in their class again. The finest pig, however, in the yard, was one ex-

hibited by Mr. H. Whittaker, of this city, who had fed it on diet seasoned with Thorley's and Henri's cattle food, and the cup, value £10, was awarded to it. We must not omit to notice that Mr. Samuel Wiley, of Brandsby, showed a pen of the finest pigs, as extra stock, that have been seen for some time. They took a prize at the recent Birmingham show, and here they attracted the attention they deserved.

THE OLD NORFOLK FARMER AT THE SMITHFIELD CLUB SHOW.

DEAR SIR,—I am sure the Smithfield Club ought to be grateful for the splendid weather they have had for their annual festival, which is, more and more, becoming a serious national institution, involving considerations far more important than the mere exhibition of the animals. It may be looked upon as a powerful means of strengthening the ties between the various classes of society, increasing the loyalty and attachment of the middle and lower classes to the Sovereign and the Government, and as promotive of a willing submission to law and order, and a determination to uphold the rights and privileges of the people against all comers.

For my part, the intimate association of beef and loyalty was ingrained into my very nature from my earliest childhood, probably from hearing in my youthful days the songs which were then in fashion; for our artists and poets have in all ages shown their appreciation of the old English fare—roast beef, in contrast with the wishey-washy *soup maigre*, &c., of the continent. Thus, the talented painter, Hogarth, in his burlesque painting of "The Gate of Calais," makes the half-starved hungry French sentinel exclaim, on seeing a baron of roast beef pass by:—

"Oh! rare *ros bif*, loved by all mankind,
If I were doomed to have thee
Well-dressed and garnished to my mind,
And swimming in thy gravy,
Not all the country's force combined
Should from my fury save thee!"

This was the feeling during the first-half of the last century, when we were at peace with France; and it had lost none of its intensity at the close of it, when war was raging. I recollect being taken by my father to the theatre at a provincial town in Norfolk in 1794. The revolutionary fury was then at its height in France, and the theatres in this country were employed, or at least encouraged, to turn it into ridicule. A song was sung on that occasion by the manager (Mr. Brunton), the two first verses of which ran thus:—

"Begar! 'tis von shame," said a French democrat,
"To see dose bold Englishmen laugh and grow fat;
While dey stick to dere King and dere own Constitution
And turn up dere nose at our Grand Revolution!
So sing, dance along, &c., &c."

In dat land of *ros bif*, while *ros bif* dey can gorge,
For noting dey care *but ros bif* and *King George*.
We would cure dem of all dere national grief,
And den ask in return *but to be in dere bif*.
So sing, dance along, &c., &c."

This, of course, was brought out in contrast with the "Sham freedom and frogs" of France, as the concluding line of one of the verses expresses it. Well! you will think all this a curious exordium to a letter on the Exhibition in Baker-street. My object is to show that there is a more powerful connection between the food of a people and their political condition, influencing their feelings of attachment to their country and its institutions, than a *prima facie* view would lead us to suppose. While, however, we continue to swear by the "Roast beef of Old England" as stoutly as ever, I hope and trust that the increasing intercourse between us and our Gallic neighbours will dispel all that feudal nationality which formerly led us to look upon each other as "national enemies." We are all children of one father, and I have a firm belief that the time is not far distant when a cosmopolitan principle and feeling will bring all the nations of the earth into one universal brotherhood.

A damp was thrown over the meeting of the members of the Smithfield Club by the severe loss the institution has sustained by the death of the president, the Duke of Richmond.

This event was made negatively apparent too, to the visitors, by the absence of animals exhibited in his name, as has been usual. The loss, however, is not irreparable; for, without any disparagement of the noble and patriotic character of the late Duke, or any insensibility to his inestimable services to the agricultural interests, I may with truth affirm that he was a faithful type of a numerous body of our landed aristocracy, who, unlike the military hierarchy which forms the aristocracy of France, take a deep interest in the rural affairs of the country, and expend their money freely in the promotion of the prosperity of agriculture. On the present occasion, the choice of the Club has fallen on Lord Berners, who will, I doubt not, sustain the position of president with satisfaction to the agricultural interest.

I attended the "Show" this week on every public day. In passing through it on Tuesday it struck me that the condition of the cattle was by no means so high as on former occasions. I do not refer so much to the deficiency in fatness, for that I should not consider an evil. I have thought that there was too much attention paid in general to fattening, which is a cover to a want of symmetry. In purchasing cattle, if you wish to select those with good points, you must do it when they are out of flesh; and this rule must be especially observed in purchasing breeding cattle. It appeared to me on this occasion that the neat stock had not been so carefully looked after as usual; and this I thought was particularly the case with the Devons and Shorthorn steers and oxen, the coats of which latter looked wiry and staring, as if they had taken a chill during the late inclement weather to which they had been exposed. A large allowance must, however, be made for such a season as we have passed through, which cannot but have a prejudicial influence on the animal as well as the vegetable kingdom exposed to its intemperance.

There were some noble specimens amongst my favourites the Devons, notwithstanding the drawbacks, which indeed, from the more delicate and perfect symmetry of the race in general, showed their defects less palpably. Mr. Heath's three-year-old, which took the first prize in class 1, was a first-rate animal, and attracted the admiration of every one. It is singular that the second prize of £10 was not awarded in this class, I suppose because there was no animal that deserved it. Mr. Heath was also successful in class 2, where he again took the first prize of £25. But I must not go through the prizes, as they are published in your journal. His Royal Highness the Prince Consort did not shine in the bovine exhibition with his usual brilliancy. How is this? I cannot believe that he is growing tired of the trouble, as he is a devoted farmer, and has erected splendid buildings for his stall-fed cattle on the Flemish Farm at Windsor. The Earl of Leicester's cattle were very creditable, as were those of Mr. Robert Farthing. The Devon heifers and cows, I thought, were better generally speaking than the steers and oxen; the first prize No. 22, class 3, was a beautiful animal; nor was Mr. J. Farquharson's, No. 20 in the same class, much behind it. It is a positive evil, however, to keep milch cows in such high condition as some of those exhibited displayed. It is impossible for them in such a state to give much milk, although what they do give may be very rich in cream, as it is well-known the Devon milk is in general.

The Hereford cattle, with the exception of No. 35, class 5, which got a first prize because it was the *only* one in the class, were, I thought, better than they were last year. If there was one in all the classes of this stock that I admired more than another, it was No. 47, class 8, belonging to R. Hill; and next to it was No. 43, class 6, a noble steer of five years

old, off whose ribs I should be quite content to eat my Christmas dinner.

I shall pass the Shorthorn steers and oxen, with no other remark than that in general they fell far below the mark, and many of them had no business there at all, having neither symmetry nor anything else to recommend them to notice except size. The heifers of this breed, however, were more creditable, and *Bomarsund*, No. 82 class 12, which gained the £20 prize, was as fine a type of the breed as could be exhibited.

The Sussex cattle, both steers and heifers, were well represented, and I thought them more numerous than last year. They are new acquaintances of mine, and I scarcely know their good qualities, but I should think they are well calculated for working oxen, and that they fat slowly. Am I right?

My own county and its neighbour Suffolk, I am sorry to say, cut but a sorry figure. No. 103, class 15 (to which in the catalogue I see I have attached the epithet, *Bull!*) took the first prize because it had no competitor. I cannot reconcile my mind to the idea of giving a prize in such a case, as it can be no honour to the receiver, and is therefore thrown away. There are other similar cases, against one of which, No. 127, class 24, the judges themselves have put "no merit" in the catalogue of prizes. It was, in fact, the only Irish animal in the "show."

Referring back, however, to the Norfolk and Suffolk polled cattle, I must claim for them the character of excellent milkers, whatever they may want in symmetry; but in an exhibition where this last qualification is so much thought of, they have little chance of being admired. There were only four specimens, one Norfolk, No. 105, class 16, belonging to Mr. R. Cooke, of Livermere, which was a decent animal, but had nothing particularly striking about it.

Long-horned cattle appear to be getting out of fashion, only three of the breed being exhibited, each of which took a prize. Lucky fellows, in having no rivals!

The Highland and West Highland cattle were fine stalwart fellows, but they made as *outré* a figure at the "show," as so many Caffres in the "no-dress or undress," or North American Indians, would do in Cheapside or in Buckingham Palace. They might have been taken for buffaloes from the American Prairies had they a little more mane, so shaggy are their coats. I wonder the Highland farmers do not shear them in the spring, as well as their sheep. Certainly their wool would be as useful as that of the Llama of America, and would make excellent cushions at any rate. The owners ought to give me credit for this hint.

The Galloway Scots are a more civilized race, and I was sorry to see so few of them, as they are rather favourites with me. Here again Mr. Heath took a prize, but not the first, which was properly awarded to No. 124, a remarkably fine animal. I was sorry, I say, to find so few of this breed at the show, for next to the Devons they are the best stock for grazing of any, in my opinion, and they are less trouble in the yard.

There were only three Welsh cattle. The first prize, 129, was a very fine animal.

There were some excellent animals amongst the cross or mixed breeds, which I think were equal in condition to any exhibited. Nos. 135, class 28, belonging to Mr. Edmund Beare, a three-year-old off steer, and 141, class 29, the property of Mr. R. Gibbs (albeit the latter did not get a prize), were particularly fine animals. These races of cross-bred cattle are not favourites with the professional men, who will patronize nothing but pure blood, when they can get it.

Amongst the extra stock there were some good specimens; but I have exceeded my limits of a letter, and must reserve my notice of the sheep and pigs to another week.

Yours truly,

AN OLD NORFOLK FARMER.

London, December 15.

THE FARMER'S ALMANACK, by Messrs. C. W. Johnson and W. Shaw, has long been a favourite with the agricultural public for the clearness of its information, its scientific character, and its hearty smack of country life and occupation, remarkably useful and intelligible.—*John Bull*.

A WORD UPON THE PRESENT WHEAT SOWING.

This has been one of the most difficult seasons for wheat-seeing ever remembered, and very large breadths have been put in under very doubtful circumstances. The rain has been so heavy and continuous, that but a day now and then could be depended upon for sowing at all, and then most frequently the land "worked" in a very unsatisfactory manner; the tenacious clays could scarcely be worked in any way, and the seed on almost all retentive soils has been put in very badly, no land has been well pulverized, and in few cases has the soil been well covered in. Moreover, the soils having become so saturated with water, after a cold summer the seed does not appear to vegetate kindly, and already many "patchy" and thinly planted fields are observable. The grain sown, too, does not possess the usual strength and vitality, hence much apprehension is felt relative to the condition of the wheat plant generally. The question then arises as to the best course advisable to be pursued for the lands yet to sow. That there remains as yet a large breadth to be sown is unquestionable. What is now the best course to pursue? My answer is, on no account to put in the seed improperly. If the land is not dry, and will not work kindly, so that the seed can be fairly covered in, by all means let it alone. It is of no avail to put in seed at this advanced period, except under very encouraging prospects. Should the weather become comparatively mild and dry, the temptation to proceed may be, in some cases, yielded to, if all can be done in a business-like way, and the land is not liable to lose plant in the winter; but, if any reasonable doubt is entertained as to safety, it is by far better to wait till February, and take the chance of a favourable opportunity for finishing the seeding as quickly as possible, then taking care to keep all other farm work in a forward state so as to be at liberty for all hands and teams to aid in the completion. This will be found the most advantageous plan. Suppose the whole to be got in, the latter seeding will be liable to every depredation. The slug will attack it both beneath and above. The rooks, larks, and other birds will be constant depredators in open weather, and the seed itself, owing to the coldness of the soil, will be very liable to perish from excessive frosts.

If, however, we grant that the grain may escape the disasters, still, owing to the state of the soil and the lateness of the season, it will scarcely be any forwarder than if sown in February, and then it will be by no means so precarious; the advent of spring is then at hand; the weather is becoming gradually warmer, the seed vegetates quickly, and is succoured and fostered by continually increasing warmth, so that it scarcely knows a check from the time it is sown to the time it is reaped. This is of course a desired advantage, and is well worth running the hazard of protracted frost to obtain. It is not often, however, that the season is so bright that the seeding cannot be proceeded with in the latter part of February; but should such be the case, there is no remedy but to wait. In 1852 many fine crops were reaped from wheat sown in March and April, and it may be the case this season; but, be that as it may, the seed must be put in under fair and reasonable auspices, or certain loss must ensue. It is to no purpose, on the average of soils, to put it in after a doubtful fashion. The cold, excessively saturated land cannot give it due vegetating power, and a sickly vegetation cannot abide a series of severe frosts; but if it does succeed partially, the drought of summer will so bake these lands that light crops must be the inevitable consequence. Land must be open and porous, to allow a free growth; not kneaded like brick earth, and baked as in a slow clamp.

I am as backward as my neighbours. My intention is to take advantage of every decidedly favourable opportunity of getting my seed in well, as I am not liable to lose plant: but at present I see no hope, and shall therefore wait as patiently as possible for a suitable time. But if indeed that should not come till it is too late, I shall then substitute barley, oats, or potatoes. I see no wondrous advantage in the wheat crop; and if it is put in so unfavourably as to produce but a "half-crop," why it is infinitely preferable to substitute the crops I have named. It is imperative that everything should be done well and in proper season.

CALENDAR OF AGRICULTURE.

The first month of the year is generally the stormiest period of the winter—in frosts, heavy snows, deluges of rain, with violent winds; but sometimes with intervals of fresh open weather. The latter times are very suitable for ploughing grass lands for Lent crops, as the season affords a time, before sowing, for effecting a pulverization, and it does not, by a lengthened exposure of the land in a ploughed state, reduce it to a hard battered condition. The ploughing also of stubbles for green crops must be done this month, and ended if possible.

When frosts and snows prevail, the attention of the farmer will be directed to carting-works of every kind; of stones, to drains and roads, of fuel to all householders on the farm, and of dung from the cattle-yards to the fields when it will be wanted for the fallow crops. Lay the heap in a lane or in a convenient place in the field; make it an oblong square in shape, sloping at the ends, to allow the loaded carts to pass upon and over it. Spread each load evenly over the heap of about six feet in height, dress it neatly, and lay earth on the edges: the heap should have a dry lair, and level.

In fresh weather, continue the cutting of copses and underwood, the cutting and splashing of hedges, the scouring of ditches and roadsides, and clear water-courses; cut drains to half the depth, to be finished in summer. Flood water-meadows and lay dry occasionally. Sow winter tares and spring wheat on lands cleared of turnips, and on fallows missed in autumn. Collect and prepare artificial manures, and keep them under a dry open shed.

The live stock of the farm of every kind will demand the most constant attention of the farmer, if he would rear the animals into profit, and derive advantage from his labours; never forgetting the great effects of minute care in increasing the produce of land. Supply the cattle in the yards with fresh straw daily, and give turnips or other roots early in the morning, that the cattle may eat during day-light, and be seen when choked or swollen.

Turnips are better drawn fresh from the field daily as wanted; but the danger of heavy snows covering them from use, renders necessary a heap at the homestead, containing a few weeks' supply. The yards must be littered with straw frequently, thinly, and evenly.

The milch cows will now begin to drop calves: feed with succulent food, with steamed roots and chaffs. Suckle both veal calves and for weaning: when milk is exposed in the pail, the valuable parts in the gaseous fluids go off by evaporation, and hence the superiority of suckling over hand-feeding. If any dairy produce be wanted in butter and cheese, a portion of the cows may be used for that purpose, and the other for rearing calves. Allow ample food in every case. Have the calf pens divided into single apartments, about four feet by eight feet, opening into the cow-shed from the end or from behind, if the width of the shed admits.

The sheep flocks must have fresh turnips daily from the field, rooted, but not topped, and in separate fields when lodged in different flocks, as ewes, keeping flock, and fattening lots, as arranged after autumn. The lambs of the last year and the fattening flock may be confined on the growing turnips, or be fed on a ley or stubble field. A two-horse cart-load will be sufficient for forty fattening animals, and for one hundred store sheep, in a day.

Feed work-horses with cut chaffs of clover and straw, with oats and beans; and give a feed of steamed potatoes, when done work, in the twilight.

The piggery must not be neglected: feed largely, and litter amply. Rear the store pigs with rawroots, as potatoes and beet the fattening hogs with steamed roots, chopped and mixed with meal served regularly thrice a day. No stock pays better for attention than pigs.

Feed poultry with light grains, and steamed potatoes, mashed and mixed with meal, under a shed or cover, and have the lodging-house comfortably fitted up, and heated if possible. Separate apartments for each kind of animals are preferred.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

The inclement weather of this period of the year, reduces the operations to little more than to suggest. At all events, they who wish to have lettuces, salads, and radishes *early*, must be possessed with frames and lights. We do not allude to forcing, but simply to protection with some kinds of lining of dung, fern, or straw, laid so thick around the box and lights or brick pits, as to exclude frosts, which last for many days. Admit the fresh air daily in fine intervals: close sashes at night, and cover with straw mats in freezing weather, which is a very effectual defence.

If the weather and ground be open, the green and white cos lettuce, and the brown Dutch, and

also a sprinkling of short-topped radish, may be sown on a warm border; the earth must be free, open, and rich, to promote quick growth, and straw and fern thrown over them during hard nights. Sow radishes twice. A little horn-carrot, a drill of round spinach, some mustard and cress may be sown, but often with little success. Peas and broad beans should be sown at least three inches deep, in soil enriched in the autumn. Earth up peas and beans if any be ready, in the driest weather. Transplant cabbages from the seed-bed.

If frosty, protect the frames and cauliflowers under glasses, celery by a couple of boards laid sidewise, or by straw on each end of the ridges:

wheel out manure to be ready for plots, and asparagus beds, and similar purposes.

FRUIT DEPARTMENT.

Prune very little, unless the buds protrude very much: lay dung around the roots of gooseberries, currants, and raspberries, which will much improve the spring growth; do the same with fruit trees and espaliers.

FLOWER GARDEN.

In snows, shake it all off before the sun breaks out, from evergreens, to prevent scalding and other damage to the foliage. Flowers cannot yet be planted, but the seed may be sown in pots under frames, with a mark of each kind. Much time and labour are thus saved, and the propagation of flowers is well secured in this way.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR DECEMBER.

During the greater portion of this month, notwithstanding that rather large quantities of rain fell in its early part, the weather has been tolerably favourable for out-door farm labours. They are, however, somewhat backward even in our best counties, and we regret to learn that the quantity of winter wheat sown, up to this time, is smaller than in the general run of years. Considering the deficient nature of the new crop, and the poor condition in which it continues on offer, the probable falling off in the production of the heavy wheats next year may be followed by consequences of no ordinary importance to the country generally. In the first place, a deficient supply of English wheat in 1861 must lead to heavy shipments of bullion to purchase foreign corn; and, in the second, the mercantile classes may be suffering from the effects of a high range in the value of money, as the result of a scarcity of unemployed capital.

There has been an improved feeling in the demand for all descriptions of wheat, at an advance in the quotations, compared with the previous month, of from 3s. to 4s. per qr. The imports from abroad have continued on a large scale for the time of year; nevertheless, there has been very little increase in the stocks in warehouse, either in London or at the outports, the demand for inland consumption, owing to the poor condition in which English samples have come to hand, having been unusually active. As regards the future range in the value of wheat, a few observations may be necessary. It is generally admitted that at least a moiety of native wheats are unfit for millers' purposes without a large admixture of foreign produce; it follows, therefore, that the demand for the latter *must* continue somewhat active for several months. With this prospect before them, and as corn bills are still somewhat freely discounted by the leading banking firms, it is scarcely possible that forced sales of either red or white parcels will be made by the importing houses. On the contrary, it is evident to our minds that even greater firmness will prevail, and that prices, as a consequence, will continue to harden, more especially as the importations during the remainder of the winter must fall considerably short of recent arrivals. The exports from the United States, which, since the 1st September, have exceeded 1,000,000 qrs. of wheat, and nearly 800,000 brls. of flour, have almost wholly ceased; but, when we consider the present comparatively low freights, the abundance of grain in the interior of the country, and the favourable turn in prices here, heavy shipments from America in the spring may, we think, be calculated upon with safety. France may have very little to spare for us; but from other parts of the continent we may anticipate steady arrivals in the period here indicated. But will those importations reduce the value of wheat much, if anything, beneath its present level? We think not; because it is quite clear that they will not be in excess of our actual wants. There has been a steady, though not to say active, demand for spring corn, especially for fine barley and oats, at full quotations, which are likely to be supported for some time.

Most of our markets have been well supplied with potatoes, in good saleable condition. The demand for them has ruled steady, and prices have ranged from 80s. to 150s. per ton. The disease does not appear to have spread itself in the pits, and Scotland continues to ship largely, as we anticipated. We may, however, take it for granted that

prices will rule high during the next three months, as the Continent appears to have very few potatoes to spare for us.

The supplies of beasts on sale for Christmas consumption have been on a very large scale, and, for the most part, they have appeared in good saleable condition; nevertheless, the demand for them has been active, and prices have ruled high, considering the abundance of really good stock on offer.

Sheep, calves, and pigs have sold at full currencies; but the demand for them has been by no means brisk. From all quarters unfavourable accounts have reached us in reference to the bad quality of the winter food. Much of the hay is in a musty state, and the usual properties of beet and other root crops have not been fully developed, owing to the want of sufficient warmth in September and October. In proof of the great difference in the value of meadow hay, we may observe that prices now range from £2 to £5 8s. per load.

Since the close of the public sales of colonial wool, the demand for all kinds of wool has been in a most inactive state, and prices have ruled almost nominal. The supply on offer, however, is still very moderate, and the importations continue on a limited scale. During the first eleven months of 1860, the exports of English and Irish wool amounted to 10,997,181 lbs., against 8,526,766 lbs. in the corresponding period in 1859, and 12,935,745 lbs. in 1858. In the same time, the shipments of foreign and colonial wool were 26,885,794 lbs., 26,051,629 lbs., and 24,228,005 lbs. respectively.

Notwithstanding the failure in the growth of hops, the demand, arising from heavy importations from abroad, has fallen off, and prices have had a drooping tendency. The general quality of the foreign hops on sale is by no means fine.

There has been a moderate demand for wheat in most of the markets held in Scotland, and prices have been on the advance. Rather large quantities of barley and oats have found buyers for England, and the transactions in other produce have continued on a fair average scale.

In Ireland, there has been very little movement in the grain trade. Wheat, which for the most part has appeared on sale in fair condition, has commanded rather more money, and other articles have sold steadily on former terms. The exports to England have increased to some extent. Potatoes have come forward somewhat freely, but their quality has turned out rather inferior when compared to some former years.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The leading feature of the month has been the annual gathering of the Smithfield and other clubs, established for the purpose of increasing our supplies of food, and for the encouragement of those who have invested their capital in the production of first-class animals for the butcher. Although the past has been an unfavourable season, arising from the enormous quantities of rain which have fallen in most parts of the United Kingdom, the weight and condition of both beasts and sheep exhibited at the leading shows have been quite equal to most former years, even though we have observed less fat upon many of the beasts exhibited.

The various markets have been heavily supplied with stock

in prime order; but, with some few exceptions, it has come to hand in more saleable condition than in some previous seasons; in other words, more consumable meat has been offered and disposed of. This, we conceive, is a step in the right direction, because all must be aware that animals produced beyond a certain weight too frequently lead to heavy losses on the part of the graziers. Good and fine beef has been currently disposed of at 5s. 4d. per 8lbs., and some of the best Down sheep have realized 6s. per 8lbs. Considering the large supplies on offer, these are high currencies; but they tend to show that the country, almost generally, is in a prosperous state. Certainly, the consumption of meat does not fall off; hence, it seems to follow that quotations will continue to rule quite equal to those now current. The Lincolnshire season for beasts is rapidly drawing to a close. Had the weather been more favourable, it would, no doubt, have proved a most profitable one; but, owing to superabundant moisture, the production of fat stock has been attended with many difficulties, besides greatly interfering with the value of the food produced. There appears to be nearly, or quite an average number of beasts in Norfolk, &c., preparing for the London market; whilst, in Scotland, the supply is fully equal to the previous season. We regret to find that foot-rot has increased amongst the sheep in some midland counties. Should the disease spread, mutton must become a very dear commodity.

The total supplies of stock exhibited in the Metropolitan Cattle Market have been as follows:

	HEAD.			
Beasts	..	..	..	24,540
Cows	..	..	..	510
Sheep	..	..	..	82,340
Calves	..	..	..	1,577
Pigs	..	..	..	2,445

COMPARISON OF SUPPLIES.

	Dec.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1859.....	24,484	470	78,980	1,171	2,187	
1858.....	20,523	490	74,274	1,412	2,450	
1857.....	19,830	375	69,132	1,209	1,915	
1856.....	23,995	475	73,200	1,526	2,380	
1855.....	22,412	590	94,030	1,376	3,184	
1854.....	20,298	120	88,880	1,573	2,746	

Beef has sold at from 3s. to 5s. 6d., mutton 3s. 4d. to 6s., veal 3s. 10d. to 5s., and pork 4s. to 5s. 4d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	Dec., 1856.			Dec., 1857.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef, from	3	10	to 5 0	3	0	to 5 0
Mutton	4	0	to 5 6	3	2	to 5 0
Veal	3	8	to 5 6	3	10	to 5 6
Pork	3	8	to 5 4	3	6	to 5 4
	Dec., 1858.			Dec., 1859.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef, from	3	0	to 5 4	3	2	to 5 4
Mutton	3	2	to 5 4	3	4	to 5 4
Veal	3	4	to 5 0	3	8	to 4 10
Pork	3	2	to 4 2	3	6	to 5 0

The arrivals of beasts last month from Norfolk, Suffolk, Essex, and Cambridgeshire amounted to about 3,000 Scots, &c.; from Lincolnshire, Leicestershire, and Northamptonshire, 11,000 shorthorns, &c.; from Devonshire, 800 Devons; from other parts of England, 2,650 various breeds; from Scotland, 1,004 Scots and crosses; and from Ireland, 1,450 oxen, &c.

The imports from abroad, into London, were as under:—

	HEAD.			
Beasts	..	..	..	2,513
Sheep	..	..	..	16,452
Calves	..	..	..	1,556
Pigs	..	..	..	274

Total 20,795

In the corresponding month in 1859, the importations amounted to 17,430; in 1858, 19,099; in 1857, 6,608; in 1856, 11,079; in 1855, 19,515; in 1854, 18,349; in 1853, 21,918, and in 1852, 11,870 head.

Unusually large supplies of all kinds of meat have been on offer in the dead meat markets, both from Scotland and different parts of England; nevertheless, the trade has continued steady, and prices generally have been well supported.

CORNWALL.

With the exception of ten or twelve days in November, we have had almost daily, for several weeks together, a succession of pouring rains, which have retarded all kinds of field-work, and never was the land in a worse state for receiving the seed. The wheats which were sown early are making little progress, but the quantity remaining to be sown at this season is beyond all precedent, and a large portion must now stand over until the spring. And this is not all that is left undone, for there are thousands of acres of stubbles yet to be ploughed, and those which are ploughed cannot be cleaned, and whatever filth there may be in the land there it must remain and grow till the weather gets fine. The farmers who availed themselves of the dry weather in November, and stored their mangolds, did well, although those still in the land have increased in weight; and so have turnips, generally. The former are a light crop, mostly small, with a great number of roots taking a firm hold in the ground. The late-sown aweds are very small, but the early-sown are better, and not injured by mildew as in former seasons. The pastures have a beautiful verdure, and afford a quantity of keep for sheep. Hay is found to cut out badly, being in many places both mouldy and overheated. Straw also is generally bad. Wheat is found to yield badly, and when it becomes thoroughly dry the yield will be less; but, notwithstanding this, nearly all is sound. Barley is by far the best yielding crop. Oats are of bad quality. There is a good demand for best samples of wheat at 7s., inferior down to 5s. 6d. per bushel; barley from 4s. 6d. to 3s. 6d.; oats, 3s. 2d. to 2s. 11d. Good beef is scarce, and worth from 63s. to 65s. per cwt.; prime, for Christmas market, 70s., and above. Sheep of late have been rather druggish, but there is now a better demand at 7d. per lb. At the late fairs store cattle lay very much on hand; a turn, however, seems to have taken place in favour of the seller, and higher prices have been demanded. From the considerable quantity of rain which has fallen during the last twelve months, or more, it is feared that a great loss will be sustained in many flocks from the rot, more particularly on the retentive undrained clays. We have heard of many being sold for about the value of the skins. This must be felt before the end of another year. Owing to the very high price of metals, great exertions have been made to work many of the old mines, as well as some new discoveries, which have given employment to a number of men. In addition to this for some years past, a very large portion, particularly from the western part of the county, have emigrated to America and Australia, thus causing full employment for those that are left; and persons who are acquainted with emigration know full well that we have not the best men left at home—at good wages, indeed, they are demanding an advance. The great failure of the potato crop in this county compels us to import extensively from Scotland and other places. Apples were a partial crop: in some orchards the crops were immense, whilst in others equally well situated they were bad; but, in all cases, the fruit was small and shrivelled, and the trees lost their foliage in many places while the apples remained.—Dec. 13.

DERBYSHIRE.

It would seem strange to say that on the 17th of December the harvest was not gathered—and still it is so: within a few miles of us (with snow falling) both beans and wheat are still in the fields, and the prospect of such being secured we leave the reader to judge of. Still the great bulk has been carried for some time, and in a sounder state than could have been expected. It has been put together in a very damp condition, and it would be difficult to say when it will be fit for human food. Where the thrashing machine has been at work the yield is woefully complained of; in many instances, where gathered from cold clay lands, one half the ordinary quantity is wanting; very dry loams and sands in early localities in this county and the adjoining (Notts.) are the exception, and the occupiers of such express themselves as being satisfied. Our grass lands retain their verdure, and have kept the stock much better than could have been expected. The sad necessity of testing the quality of the hay stack is now taking place; and a poor concern it is—just as bad as you could expect, and a little worse. The question put on all sides now is, how is it to be consumed? Steam it, we say, and use it up

with aromatic food ; dried oats, ground, we think, is the best. Much good may come out of such circumstances, for it will teach us how to economize food, and make the best of an inferior article. Turnips and mangel, where taken up, have been found light crops, and very valuable for the bulk. The potato crop was indifferent enough, and the quantity of good ones very small in amount : we despair of ever again finding them good as in the olden times. Our seed time has been but an indifferent one. Much put in as bad as possible: the ground so trampled that it was a common saying with the labourers, "More harm than good." The breadth put in very limited. What the result will be must rest with the future. Farming work is backward, and in those districts where summer fallows are yet made we see many fields in a sad state—foul enough to tempt the farmer to give it another year's rest. Our stock markets and fairs have been dull, and only first-class things have found ready customers. The corn markets for English produce have been sluggish in the extreme : wheat never did come in (as far as our memory serves us) in such damp condition, and the range of value is very great. Kiln-drying, and every expedient the mind can think of, are resorted to, but nothing makes it a favourite. There is a tenderness about it (not arising from sprouting) which perhaps may never be removed, and probably the cause is the want of sun during the period of growth. It is well for us that old is in fair supply, and foreign in abundance. All spring-grown grain comes to hand out of condition, and maltsters complain much of the working of barley—its irregular sprouting. The statutes, or the annual season for the hiring of servants, have been duller than usual ; not much lower the value of labour, but a slackness of engagements among masters, from, we fear, in too many instances, a lightness of cash. Day labourers are all employed, and all surplus labour readily taken up by the railway now in formation. We are fast drawing to the close of the year, which, for perplexity to the farming community, has had few equals. Surely the better time is coming.

WEST GLOUCESTERSHIRE.

We have now to supply the last communication for the year, one which will be remembered as the wettest recorded for a long time past, exceeding the memorable wet winter of 1852 and 1853, inasmuch that more rain has fallen throughout the summer. On the driest soils, especially on the hills, the early-sown wheats are up and looking promisingly, but on the cold and wet lands we cannot speak so favourably, and on many of those sowing has not been completed ; indeed, since our last report very little progress has been made in such situations. Rain, more or less, has fallen almost daily, and those lands are absolutely waterlogged. The care of stock is at the present crisis the most important consideration, and in this neighbourhood it is too frequently woefully conducted. A most mistaken view of economy is adopted, and the necessary adjuncts of meal or cake are regarded as extravagances. There are some who set better examples, but too few profit by them. It should be remembered that unless young stock is improving, the farmer is losing instead of gaining money by them. Thus, if growth is imparted by the summer's grass and the animal remains stationary, so to speak, throughout the winter, it is worth very little more in April than it was in October. Stores have been selling very low ; but those who have purchased, possessing courage and discrimination to keep them well, may anticipate good profits in the spring, when those in good condition may reasonably be expected to realize remunerative prices. Fat cattle and sheep are selling well, the demand for the approaching Christmas supplies being considerable. Neat cattle are not the only animals we have to notice as not being sufficiently provided for during the winter months. The few horses that are bred in this county are destined to the same parsimonious system. Even housing them is considered too great an indulgence, or it is too much trouble ; and as to a feed of corn for a yearling or a two-year-old, that is extravagance not to be tolerated. A run with the cows or heifers, and, with them, to be supplied with hay, which this year is generally of bad quality, is all that such animals are thought to require ; and if a foal, in its desire to share with its companions a portion of the scanty food, is drawn from its repast by a more powerful animal, and gored by its horns, the mismanagement is forthwith ascribed to bad luck. No such term should be admitted in the vocabulary of

the farmer. The festivities of Christmas are fast approaching. May every hospitable hearth be surrounded by happy guests ; may the enlivening mirth, which on those occasions prevails, dispel all dismal reminiscences of the past ; may the succeeding year commence with more cheering aspects, and compensate for the difficulties with which we have had to contend throughout the year which has so nearly run its course.

SOUTH HERTFORDSHIRE.

We are fast approaching the close of 1860, which will be long remembered by the present generation of farmers as the most trying and disastrous of years. To many we fear it will prove a ruinous season, as in some instances the hay crop was spoiled, the corn all weathered, root crops a failure, and the greater part of the ensuing wheat crop is yet unsown. As we premised, in previous reports, farmers are at their wits' end to know what to take to market. It has, so far, been useless to thrash rough or raw wheat : samples of such have lately been exhibited, week by week, at our market, without obtaining an offer from miller or dealer. Weathered barley, also, is a drug, unless it is dry, and such lots are scarce. The best samples of malting barley have receded full 5s. per qr. in price, and maltsters are not eager buyers : they complain loudly of the barley not growing, and prefer Scotch to English growth. Wheat has not been thrashed to any extent, the condition proving so bad, and foreign wheat and flour are extensively used. Farming operations are generally backward. The protracted harvest retarded the sowing of wheat in October, and the heavy rains prevented it in November, whilst the sudden and severe frost has now stopped the ploughs and all cultivation. There are some good fields of wheat, which were sown in October ; but many fields are thin, owing, in part, to damp wheat being sown, which the wet weather caused to rot, and the young shoot perished. A large breadth of land intended for wheat is yet unsown, and there is no telling now when wheat-sowing can be resumed. The ploughing of fallows is anything but forward, which is much to be regretted, if the present severe weather continues. Now we are all busy carting dung on the land, dressing pasture land with compost, and rendering our live stock as comfortable as possible. The present bracing weather will have a good effect on the corn in stack, and we may hope to see it come to market in improved condition. Owing to the very bad crop of roots, and the small quantity of good hay, the number of stall-fed cattle will be very limited this winter. Fattening sheep are also much thinner than usual, owing to the scarcity of food, and the probability of a long and severe winter. Many of us suffered so much last spring from being over-stocked, that we have laid in cautiously this autumn. Great complaints prevail respecting the unsoundness of sheep, west country downs, in particular, having exhibited disease, which has caused many to drop. Potatoes are selling at a great price—£1 per sack of three bushels. The outcry against fat meat appears to have had a great effect this year on the exhibitors at the Smithfield Club Show. We never recollect seeing so many moderately-fed animals exhibited, and our impression is that the show was decidedly below par. We trust that those who are rich in this world's goods will now have a kind thought for the poor, as this Christmas promises to be one of unusual privation and severity. And not wishing to dwell on the anxious months of the year now closing, let us anticipate a more genial season in the year to come—one more productive of good to all mankind.—Dec. 22.

SOMERSETSHIRE.

Winter, in what is called the old-fashioned way, has now set in, and all progress in autumn sowing come to an end, and it is but a little over half finished. We had several days of most incessant rain, and the water was more out than for years past, the barometer came down lower than it has been for a twelvemonth ; when this is the case there is generally a change to clear weather, and the days of fine weather before the frost, which set in on the 17th, have been very beneficial. We had a fall of snow on the 18th, and more general on the 19th, two very severe frosts, Mercury as low as 21 degrees, and there is now some appearance of more snow. Very little of the wheat that has been already put in shows above-ground, and there are many complaints of the slugs eating that which has come up. Winter beans

are pretty well up, but such has been the soaked state of the land every process has been hindered, and this also applies to thrashing. For the last two weeks hardly anything has been done out of door, and the quantity brought to market has been diminished greatly in consequence; prices have crept up from 7s. to 7s. 3d. per 60lbs., and 7s. 6d. for new whites, which could not be had under 8s. for prime, but at one time the condition was extremely bad and it is not now much improved, but if we have a thaw it will be as bad as ever for a time at least. Barley has come rather freely to market, and the prices have gone down to 4s. and 4s. 3d., grinding and malting 4s. 9d. to 5s. 3d., extra higher. New beans, if dry, are worth 5s. 6d. to 5s. 7½d., but we have very few as yet out of the farmer's hands. Oats 21s. to 24s. for 34 to 38lbs. per qr. Our Christmas market has had some good stock, but the prices have been complained of, and the sale said to be dull, a good many not being up to the mark for the season could not find buyers. Good Down wethers have sold pretty well, but ewe mutton has been very irregular in price, from 4d. to 6d. per lb. Pigs have kept up to 10s., and do not appear to be over plentiful, corn for fattening being higher than for some time past. There has been more sale for good barreners, but out of condition and old cows ruinously low to the seller. Sheep if warranted would have sold better, but very severe losses have been sustained by many parties. Butter is very high, 15d. to 16d. per lb., and cheese without being a great sale is firm. A good deal of hay from the high floods have been destroyed, not having had sufficiently dry weather to remove it. It is evident that our outfalls are in a very bad condition, but such is the indifference of those most interested that they are annually losing 5s. to 10s. per acre for want of an outlay of 2s. to 3s. Some attention is now being paid to this subject in other parts of the kingdom, but we who have a greater stake than most are even more neglectful than we were fifty years since, and our outfalls are confessedly getting worse every year. When will our landowners and occupiers know what they lose from want of a better managed drainage?—12 Month 21.

SOUTH LINCOLNSHIRE.

Thanks to greatly improved drainage, we have not suffered so much in this district from the excessive rains of the past season as in some former years, but still the lands are wofully wet, and farm-work is very backward. Just now we are quite fast, as the majority of lands are so soaked as to be incapable of fair work. Much wheat has yet to be got in, and that already sown does not manifest a promising plant—in many places patchy and thin. The stoppage is not to be regretted, as in all probability a later seeding will be more advantageous. It cannot grow prosperously on lands so wet and cold, and as mildew weather approaches, the seeding should be proceeded with as opportunity serves. This untowardness of the season appears to have an effect on the corn trade; it has rallied considerably, and if the yield and weight combined are taken into account, it must advance much higher yet. We seldom hear of a crop of wheat giving 62lbs. per bush; the general runs do not exceed 55lbs., and many crops do not reach 50lbs. per bushel; and the proportion of meal given is still lower, the quantity of offal being greatly in excess. If our transatlantic brethren could not liberally supply us, the prospect would soon be very alarming. We have yet a few crops unharvested; I yesterday saw a rather large field of oats in stock. Beans are nearly all stacked. Potatoes are all up, but the diseased ones keep badly, and are so tainted that pigs will not eat them freely. The supply of these animals has greatly increased, and their value depreciated. "The shack"—i. e., stubble-keeping—has nearly all been thrown away upon them. Good strong pigs are readily selling at from 20s. to 25s. each (worth as much in July last); good stores for fattening keep their price. The loss of the potato crop, and the inferior quality of the barley, have had much to do with this serious loss to pig-breeding. Very many are now fattening upon inferior wheat, partially grown. This is mixed with barley, and ground into meal, upon which they do exceedingly well. The supply of fresh pork must be good for some time to come. We have very little beef and still less mutton left in the district; nearly all has been sent to our Christmas markets. Winter keeping

is holding out well, and we have a fair quantity left, but the quality is inferior. Sheep are progressing satisfactorily—the casualties not great. Our grass land rather wet and soft, but we have a tolerable pasture yet, and the sheep are doing well without further aid. We are under some apprehensions relative to the welfare of our labouring population. Hitherto we have had abundance of work; now no one knows what to proceed with, and many poor men are without employment. It is certainly an anomalous state of things. The price of meat is high. The price of bread is not in accordance with the price of wheat, owing to the great proportion of offal; hence our people suffer greatly. The farmer does not obtain a remunerative price per acre; he does with as little labour as possible; so that, with high prices of food, and very little work, our labouring population will soon be in a bad case. It is not that our fields are in such good plight that no labour is required—no; we never had a greater proof of the value of under-drainage, and much is needed to repair and improve the drains. Our watercourses, too, are wretched and shallow; much labour is needed to place them in good condition; the season, the weather deters those who have the power and the capital to expend—all wait for a more convenient time. To-day, Dec. 20th, our lands are all covered with snow, and a north-east wind blows coldly, giving us a timely caution to take care of our stock. It speedily tells upon unshod stock in this locality. Sheep should now have artificial food, and plenty of roots or grass, or they will soon lose condition. Ewes must be attended to.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BEWDLEY FAIR.—The attendance of buyers was pretty good, and the quantity of fat cattle was much greater than usual; many were Scots. Beef realized from 6d. to 7d. prime 7½d. per lb. Sheep were very scarce, and so were pigs—the latter slightly on the decline. Mutton brought 7d. to 7½d.

CORNHILL MONTHLY MARKET.—Some very fine lots of fat cattle were offered; but the prices not being quite so high as at former markets, a good many were turned out unsold. Young stirks in fair condition sold well. Milk cows, or those expected to calve early, were scarce, and in great demand. These brought long prices. One-year-olds, coming two, sold at from 8l. to 14l.; milk cows from 2l. to 15l.

DROITWICH FAIR.—The supply was limited, and business flat. Beef realized from 6½d. to 7d., and mutton 6½d. to 7½d. per lb.

GRANTHAM FAIR.—A short supply of sheep, and of inferior quality, very little trade being done. A pretty good show of fat beasts, which realized high prices. Good three-year-old steers much in demand. Small steers and young beasts a slow trade. Beef averaged 7s. 9d. to 9s. per stone; mutton 7d. to 7½d. per lb. Pigs were a slow trade.

LEDBURY FAIR.—There was an average supply of fat and store stock. Some prime fat cattle were offered, and the fair was in most respects equal to former Christmas fairs. Fat stock met with a tolerably quick sale to dealers, of whom there were a good number in attendance. Lean cattle were not numerous, and not much in request. A very limited number of sheep, among which were about 150 fat ones, which were speedily disposed of, but store stock was not much inquired after. But a few fat pigs, for which high prices were asked and obtained, and a good number of stores, many of which were unsold. Beef 7d. and 7½d., and for superior beasts 8d.; sheep 7d. to 7½d.

NEWTON MARKET.—There was a very small supply of bullocks, the best of which sold at 62s. per cwt. Sheep were a moderate supply, and fetched 6½d. per lb., butchers' calves 7d. per lb.; pork carcasses 11s. per score.

OSWESTRY FAIR.—The quality of stock shown was first-rate, which soon found buyers. Beef made from 6½d. to 7½d. per lb. The sheep and pigs also sold well. Fat pigs 5½d. to 6d., beef 6½d. to 7½d., mutton 6½d. to 7½d. per lb.

PAISLEY HORSE MARKET.—There was a very brisk demand for first-class draught horses, and many were disposed of at prices ranging from 50 guineas to £57 and £58. One very fine black gelding, bred by Mr. Nelson, Cochrane Mill Farm, Milliken Park, was sold by Mr. Crawford, of John-

stone, for £60; and before the market was over it was resold for £63. Inferior animals were in tolerable demand, at proportionably low rates. Altogether, prices were high, owing, doubtless, to the backward state of agricultural work, arising from the wet and unseasonable weather which has prevailed during the last few months. A few riding and hack horses were shown, some of them of superior quality, which were disposed of at comparatively moderate rates.

PERTH ANDREWMAAS MARKET was much better attended than for some years past. The demand was rather brisk. The best milch cows realized from £12 to £18 each, and second-class from £6 10s. to £11 each. The two-year-old home-breds sold at from £8 to £12, and one-year-olds from £5 to £6 each. The English and Irish beasts were in good condition: the two-year-olds realized from £8 to £12, and the one-year-olds from £4 to £7 each. First-class draught horses sold freely at high prices, a number of pairs selling at £100, and some as high as £120. Useful horses realized from £25 to £35. Very few harness horses were offered, but had a slow sale at from £12 to £18 each. Inferior sorts were all but unsaleable. The butter and cheese market was but scantily supplied; butter realized from 25s. to 26s. per stone, and cheese 4½d. per lb.

ROSS FAIR.—There were many prime cows and oxen exhibited, which sold at 7½d. per lb.; fat cows of second quality fetched 7d.; fat wether sheep bought 7d., and ewes 6½d. to 7d. There was a good supply of store cattle of an ordinary description, which met with a very dull sale, and many went back unsold. There was a goodly number of horses, a few only of which were sold, and those at considerably lower prices than usual.

SHREWSBURY FORTNIGHTLY MARKET.—There was a very good show of stock. The best prime Christmas beef sold for 7d. to 7½d. per lb., good fat beef 6½d. to 7d., cows 6d., fat calves 7d. Useful store cattle, and good cows and calves sold at fair prices; fat wether sheep 7½d. to 8d. per lb., bacon and pork pigs 6d. to 6½d.; stores without any change in value.

STRATFORD-UPON-AVON FAIR.—There was an abundant supply of fat beasts, but sheep were rather short. Business was done at 7d. per lb. for beef, and 7½d. per lb. for mutton.

TEWKESBURY FAIR was the most successful that has been held for some years past. The fat stock generally was very superior, the demand was great, and the prices satisfactory. Fat wethers sold from 44s. to 65s., fat ewes 33s. to 51s., fat cows and heifers £18 to £26 10s., fat steers £19 to £32 10s.

THORNBURY MONTHLY MARKET.—The supply of fat beef at the present market was somewhat below that of previous years, and found a ready sale at high rates. Beef, 65s. to 70s. per cwt. The supply of lean cow stock was very short, and for that offered there was little demand. There was but a short supply of fat sheep, those penned were however of good quality, and met with a quick sale. Mutton 7d. per lb. The porcine race, usually so numerous, was for once in short supply. Bacon, 10s. 6d. per score.

WARWICK CHRISTMAS CATTLE FAIR, of Monday last, kept up its fame of former years, and exhibited the stock-producing qualifications of the county. Mr. J. Moore offered for competition some prime Hereford oxen, belonging to E. Greaves, Esq., M.P., which were greatly admired for their quality. Next to which may be mentioned very superior animals shown by Mr. Burbury, Wootton Grange; Mr. Judd, of Burton Dassett; Mr. T. Pratt, of Chesterton (Shorthorns); Mr. Shepherd, of Hunningham (Herefords)—among the latter being a remarkably fine heifer, only 2½ years old, for size and quality almost unsurpassed; Mr. Wallington, of Charlecote; Mr. Lythall, of Radford Semele; Mr. E. Mann, of Chesterton; &c., &c. Mr. W. Ledbrook, of Cubbington, showed 31 beasts of very excellent quality; and Mr. Stowe, of Warwick, exhibited fine Shorthorn heifers, attracting considerable attention, both parties meeting with ready purchasers for their beasts. Mr. Hinde, of Myton, had two Shorthorn heifers (twins), about 2½ years old, of unexampled symmetry of form and smallness of bone. The supply of sheep was quite equal to the average display, and prime qualities were in great demand. Prices ranged according to quality, of both beef and mutton, from 6d. to 8d. per lb., and a clearance was effected early in the day.

WELLINGTON FAIR.—A large and excellent show of fat stock for Christmas in both cattle and sheep, as also pigs. Beef ranged, as per quality, from 6d. to 7d., mutton ditto 7d. to 8d. per lb.; fat pigs about 10s. 6d. per score. The price of fat cattle varied from £10 to £35 per head.

WORCESTER FAIR.—There was an unusually large supply of beasts of superior quality, which, for the most part, sold well. The attendance of buyers was very numerous. There was also a good supply of sheep, the best being sent for sale by auction. Pigs limited, and also horses. Beef fetched 7d. to 7½d., wether mutton 7d. to 8d., and ewes 6d. to 7d.; pigs 10s. to 12s. per score. There was an active demand for fat stock, but stores were in small request.

YORK FORTNIGHTLY MARKET.—This being the fair before Christmas, there was a very good show of fat beasts, which sold well at 8s. per stone; good wether mutton 8d. per lb. Very little lean stock shown.

YORK CHRISTMAS HORSE SHOW.—The subjoined is a list of the prices at which animals have been selling during the show. Hunters: high-bred young horses, broken for the hunting field, from £100 to £300; ditto, seasoned, and fast over light country, £100 to £300; ditto, horses of celebrity, and up to heavy weight, £300 to £400; well-bred, upstanding young horses, with great action, suitable for private carriage purposes, £70 to £100; selections of match colts, of good fashion, and greys or bays, £70 to £100; seasoned ditto, high steppers, and broken in double harness, £40 to £60; active light stepping horses, adapted for Brougham and light carriage work, £70 to £100; useful fast-going animals for single harness, £40 to £50; thick set, short jointed young horses, for hackney work, £20 to £30; well framed, powerful, high legged young horses, for van or railway work, £30 to £40; cover hacks and roadsters, £30 to £40; well-bred Galloways, £15 to £20; neat going, compactly built cobs, £40 to £50; weight-carrying, handsome cobs, £60 to £70; neat young ponies, £10 to £20; ditto, well matched pairs, £15 to £25 each; well timbered, active, young cart horses, suitable for London work, £20 to £40, according to merit. Matched teams of fast walking young horses, £25 to £40; useful seasoned horses for agricultural purposes and machine work, £28 to £37; two-year-old cart horses, £15 to £20; yearlings, none shown; blood stock, none on offer; stallions from £200 to £400.

IRISH FAIRS.—CASTLEDERMOT was poorly supplied with every description of cattle, owing probably to the sudden advent of harsh weather. Two-and-a-half-year-old bullocks sold at from £9 to £11 10s. a head; fat beef 45s. to 56s. per cwt.; two-and-a-half-year-old store heifers £9 to £11 each, and springers from £12 to £18, a rate which was considered very high. Fat sheep brought from 6d. to 7½d. per lb. Lambs 25s. to 32s. each. The horse fair was well attended by buyers, but the show of stock was exceedingly meagre. There were few sales effected, but good draught horses averaged from £15 to £25. **SCARTAGLIN:** Not a hundred good pigs, and even of that number some remained unsold, though they did not exceed 50s. per cwt. In-calf cattle were in request, and bought up quickly. The class of the cattle were inferior in breed and condition, but were in demand, the highest not exceeding £8. Dry stock was not inquired for, and milkers and springers were picked up to the advantage of the seller, but few were to be got. **MILLTOWN:** The demand for pigs was greater than at Scartaglin, and a rather better supply, but nothing equal to the demand. For local purposes the demand for the inferior class of calf cattle was brisk. Neither here or at Scartaglin was there anything like passable beef to be got. **BLENNerville:** Every good calf young beast was bought up, but no one asked for dry stock. Beef, as usual, was scarce, and consequently high. Butchers had to purchase at 47s. per cwt. for anything fair. Fifty good pigs could not be got, and 50s. per cwt. was freely given.

CORK BUTTER EXCHANGE, (Saturday last.)—The supply of Butter during the week averaged about 900 firkins daily. The severity of the weather gave a firm tone to the market, and caused prices to advance. Everything went off at the advanced prices. Since Monday firsts rose from 114s. to 116s., seconds from 108s. to 112s., thirds from 97s. to 100s., and fifths from 77s. to 78s. It is almost certain that very little Butter is held in the country.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The closing month of this extraordinary year has partly recovered the heavy decline of November, say in wheat 3s. to 4s. per qr. The weather, at the first very wet and unfavourable, has followed on with an intense frost, commencing on the 19th, so that the unsown lands must wait the return of Spring, the character of which must determine whether they shall receive wheat or Lent corn. No doubt every effort will be made to get in the higher-priced grain; but if circumstances are strongly against it, barley may be more profitable, especially as malting sorts continue to rule high, and there is less room for foreign competition in this grain. The past year may literally be said to have passed without a Summer, and but very short periods were without rain. Hence the universal complaint of poor crops and a general deficiency; but on a review of the state of the atmosphere, it seems marvellous that, notwithstanding such adverse circumstances, there has been so far a yield that some still cling to the notion that there is not much below an average of wheat, and more hay was certainly gathered than could reasonably be expected. The fact most prominent is doubtless the failure in potatoes, which as Spring advances must be severely felt. What the new year may do for farmers is beyond human calculation, but we certainly wish them much happier results than the year 1860 has brought about, and we trust their good spirits and perseverance will carry them through their difficulties. Certainly the occupants of heavy land will need the utmost energy and patience to stem the tide of untoward events. But times and seasons are so fickle that the next harvest may be as much in their favour as the last was against them.

In reviewing the course of the averages of wheat, we find the lowest were in February, viz., 43s. 6d.; from this point they slowly rose to 51s. 9d. in the beginning of May. There was then a further gradual progress till they reached their highest, 62s. 11d. at the end of September; from that period they took a retrograde course very gradually till they came to 51s. 5d. in December. So that we have fallen during the last quarter 11s. 6d. per qr.; and now appears a slight reaction upward. Fully half of this decline must be traced to increased inferiority of sample, and the remaining half, say 5s. 6d., must be considered as caused by the unprecedented arrivals from abroad, which have been pouring in at the rate of one million quarters a month, and had it not been for an equally extraordinary demand, prices would probably have been reduced fully 20s. By the side of these immense imports we place a parallel deficiency in our own deliveries, which being only half what they were last year, prove to what an extent the use of foreign wheat has gone in the manufacture of flour, as the spirit of speculation has all

along been dormant, from the prices being too high. Should frost continue, our own samples will be more fit for use, and find a better sale on diminished foreign supplies, which must now be reduced by the closing of the Baltic, and the canals in America; but even on the re-opening of navigation, we do not expect the united efforts of the world could serve us up to the next harvest at the same rate, and the void made by the potato failure would take off much, if it did. We think, therefore, the upward movement which has commenced will be of a permanent character, with probably some further advance more or less in accordance with foreign arrivals.

The stocks of old wheat both English and foreign have been working off at such a rapid rate that the chief demand has been for dry new American as its best substitute.

The following were the prices noted in the most recent foreign markets:—At Paris the best qualities were quoted 56s. per qr., good 54s.; Bordeaux top price was 54s.; Nantes, 52s. 9d. At Antwerp Baltic and American brought 61s. 6d., fine American 64s. 6d.; Marianople, 57s. 3d.; old white wheat at Rotterdam 67s., new 55s. 6d.; fine Polish and red to 72s. At Hambro' 61 lbs. Holstein wheat was worth 59s., 62 lbs. fine 63s. 6d.; 60 lbs. Wismar wheat, 59s. 9d.—all for Spring shipment, cost and freight included; new 58 lbs. red at Groningen was 46s. per qr. free on board. The range of prices at Odessa was from 38s. to 48s. per qr. At Ibrail soft wheat was quoted 32s. 6d.; Marianople wheat at Leghorn was sold at 52s. 8d. Fine white wheat at Santander 60s.; soft wheat at Algiers, 58s. 6d. Winter red at New York 40s., with a freight of 10s. to 12s. per qr.; white Western 43s. 4d.

The first Monday in Mark-Lane commenced on a good foreign, and fair supplies of English wheat. The show in the course of the morning from Kent and Essex was small, but the condition was too poor to make it saleable, though only held on the previous terms. Foreign, however, experienced a fair demand at full prices for good quality. The same complaints as to condition prevailed this week in the country, where prices generally were unaltered, though Newark was 1s. per qr. dearer, and Boston 2s. for good new. The first market at Liverpool was 3d. per cental cheaper, but on Friday there was some reaction.

On the second Monday there was a very heavy foreign supply, say 64,000 qrs., two-thirds of this being from New York. The English show from the near counties was again short, and of poor quality: a few picked lots went off well, but the rest hung on hand. The supply from America attracted many from the country, who bought freely at full prices, and old foreign was generally against buyers. More tone and some improve-

ment was noted this week in the country for the better samples. Birmingham, with a full market, could establish no advance; Leeds, Louth, Newcastle, Manchester, Lynn, Gloucester, Bristol, and several other places were up 1s. per qr. Hull, Spalding, St. Ives, and Wellingborough advanced 1s. to 2s. Liverpool on Tuesday was only rather higher, and on Friday rates were supported. The Scotch and Irish markets were also rather improved.

Though on the third Monday there was again a good foreign supply, chiefly American, it was very little more than half the previous week. The show of samples from Kent and Essex was again small, but the cheerful character of the country advices induced a brisk demand for all useful parcels of English at 1s. to 2s. per qr. advance. For foreign there was a continued free demand at 1s. to 2s. more money, the principal run being on red American and dry French qualities. Floating cargoes were also 1s. per qr. dearer. There being a falling off in the country supplies, many markets were fully as much improved as London. Alford and St. Ives were up 2s. to 3s. per qr.; Hull, Manchester, Boston, Spalding, and Newmarket were 2s. per qr. dearer. Birmingham, Market Rasen, and Gainsborough were up 1s. to 2s.; Leeds, Louth, and Newcastle rose only 1s.; Newark, Sheffield, and Workson were only firm.

On the fourth Monday there was a considerable falling off in the foreign supplies, as well as but a small supply of English. Kent and Essex sent less this morning than during any market since harvest, and as the frost appeared to have fully set in, the upward movement continued, 1s. to 2s. more money being paid for the few good lots of home-growth that appeared. The attendance from the country was much lessened by this day's immediately preceding Christmas, but there was more doing than might have been expected, at an improvement of 1s. per qr. The country markets were mostly 1s. to 2s. dearer in the week.

The imports for the four weeks into London were, in English wheat 15,332 qrs., foreign 141,263 qrs.: against 32,882 qrs. English, 17,285 qrs. foreign in 1859.

The imports in November for the United Kingdom were 985,023 qrs. wheat, 515,748 cwt. of flour.

The flour trade has participated in the improvement of wheat, Norfolks opening at 40s. and closing at 43s. to 44s.; but town millers, though they have been paying very high prices for fine foreign wheat, have not raised the rates with which they commenced the month, though in all probability there will soon be a 3s. advance on the present top price—57s. American barrels have been very much in favour; the heavy arrival on the second Monday, say 45,600 brls., so far from shaking prices only, establishing them. Good barrels are now currently worth 32s. to 33s.; the quality altogether this season has been much approved, and beyond the average of years. The imports for the four weeks were, in country sorts 60,264 sacks, foreign 8,649 sacks 76,736 brls.: against 76,858 sacks English, 220 sacks 10,458 brls. foreign in 1859.

The barley trade, with rather better supplies, has

very little varied in the course of the month. The first Monday lost 1s. per qr. in value, but this was recovered subsequently in malting qualities, which in fine sorts come very slowly to hand, and are worth 47s. to 48s.; grinding foreign has been in fair demand, stocks being small and arrivals less than expected. Without heavy supplies there seems no prospect of much reduction, and the better sorts must be excluded for a time, from the closing of the Baltic. The imports for the four weeks into London have been, in British qualities 28,350 qrs., foreign 50,895 qrs.: against 36,282 English, 54,866 qrs. foreign in 1859. The November imports for the kingdom were 244,426 qrs.

The malt trade without being brisk has been rather dearer, the best Ware being worth 80s. per qr.

Oats have slightly fluctuated, leaving a gain of about 1s. per qr. on new sorts, which during the previous month were unusually depressed. Old Russian, too, have become firm, with a tendency upwards, from the fast reduction of stocks here and closing of the Russian ports. To the frost, indeed, the advance is principally to be traced, and, should it continue, we may look for a further rise—the lightness of the English corn this season being much against the sale. The imports for the four weeks were, in English sorts, 19,109 qrs., Scotch 6,612 qrs., Irish 7,606 qrs., foreign 138,360 qrs.: against 9,881 English, 6,903 qrs. Scotch, 5,125 qrs. Irish, and 82,695 qrs. foreign in 1859. The total imports for the kingdom in November were 234,476 qrs.

Beans show little difference of value as compared with the close of last month. Many soft English on the first Monday being sent up, these could only be sold by a further reduction on last month's prices of 1s. per qr. They have since been sent up in a drier state, and therefore sold better. The supplies, both English and foreign, have been on a fair scale; and the rates for good old English still rule high, and are likely to do so. The imports into London for the four weeks were 3,790 qrs. English, 9,627 qrs. foreign; against 5,181 qrs. English, and 10,127 qrs. foreign in 1859. The November imports were 46,751 qrs.

Peas have rather declined in value during the month (maples excepted), from their great scarcity. Duns, as well as white boilers, gave way on the first Monday, and, notwithstanding the frost, neither have since recovered. Should the weather, however, continue severe, we should not be surprised to see a smart advance in boilers, more especially as rates are now moderate, and they must be partly required as substitutes for potatoes. The imports for the four weeks were 2,838 qrs. English, 12,748 qrs. foreign (these latter being principally white), against 3,127 qrs. English, 5,579 qrs. foreign in 1859. The total imports for November last were 43,561 qrs.

The supply of linseed has been upon an average scale, with moderate exports. The demand for cattle-feed and cake has been good, and though at the commencement of the month there was some giving way in prices, there has again been more buoyancy in the trade, without any prospect of a

permanent reduction in values, the crop abroad being generally reported deficient.

Since the monetary pressure, the seed trade generally has been in perfect calm, dealers appearing determined to wait the events of the season. The crop of red cloverseed in this country is, nevertheless, reckoned to be quite a failure. It is reported to be so in several parts of France and Germany, and therefore, both here and abroad, prices have been fully maintained. America seems the only country whence plenty can be drawn. White seed remains dear and trefoil firm. Canaryseed has been quite a drug, though not quoted lower. Other seeds much as last quoted.

CURRENCY PER IMPERIAL MEASURE.

		Shillings per Quarter.	
WHEAT, Essex and Kent, white, new	46 to 63 fine old	65 to 72	
" "	red.	44 59 . . .	64 72
Norfolk, Linc., and Yorks., red. . .	42 58 . . .	63 69	
BARLEY, malting . . . 33 to 43 . . .	Chevalier, new. .	35 47	
Grinding 30 32 . . .	Distilling	32 37	
MALT, Essex, Norfolk, and Suffolk .	55 to 62 . . fine	68 80	
Kingston, Ware, and town made . .	56 64 . . .	67 80	
Brown		56 59	
RYE, seed new		32 37	
OATS, English, feed. . . 21 to 26 . . .	Potato	27 33	
Scotch, feed. 24 28 . . .	Potato	28 33	
Irish, feed, white	20 to 25 . . fine	25 27	
Ditto, black.	20 25 . . .	26 26	
BEANS, Mazagan. 32 to 44 . . .	Ticks	32 41	
Harrow 34 48 . . .	Pigeon	44 50	
PEAS, new, white, boilers 40 47	Maple 41 to 43 Grey	37 41	
FLOUR, per sack of 280 lb., Town, Households .		52 57	
Country 41 to 44 . . .	Households . . .	52 51	
Norfolk and Suffolk, ex-ship. . . .		41 43	

FOREIGN GRAIN.

		Shillings per Quarter.	
WHEAT, Dantzic, mixed 65 to — high do. — to 67 extra —		72 72	
Konigsberg 54 65 . . .		— 71	
Rostock 65 . . fine 69 . . .		— 72	
American, red. 61 65 white . . .		63 68	
Pomera, Meckbg., & Uckermark, red. . . .		60 66	
Silesian, red. 60 64 white . . .		63 70	
Danish and Holstein		61 66	
Russian, hard 55 to 60 . . French 55 to 64 . . white 62		66 66	
St. Petersburg and Riga		56 64	
Rhine and Belgium		61 69	
BARLEY, grinding 25 to 30 . . .	Distilling. . .	31 35	
OATS, Dutch, brew, & Poland 24 31 . . Feed . . .		22 27	
Danish and Swedish, feed. . . 24 28 . . Stralsund. 24		28 28	
Russian		24 27	
BEANS, Friesland and Holstein		36 45	
Konigsberg. 39 to 45 . . Egyptian . .		37 38	
PEAS, feeding. 40 45 . . fine boilers. 42		46 46	
INDIAN CORN, white 38 41 . . yellow . .		39 42	
FLOUR, per sack. . . French 41 48 . . Spanish p. sk. 45		49 49	
American, per bbl., sour 26 28 . . sweet . .		30 32	

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:		Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Nov. 10, 1860	58 9	41 0	23 11	36 6	51 1	44 2	
Nov. 17, 1860	58 1	41 4	23 5	35 4	50 8	46 9	
Nov. 24, 1860	56 3	40 11	23 3	34 4	48 11	48 4	
Dec. 1, 1860	54 10	39 10	22 8	35 11	48 10	45 11	
Dec. 8, 1860	52 7	39 2	22 5	35 0	47 9	45 0	
Dec. 15, 1860	51 5	38 7	22 1	33 6	45 6	43 8	
Aggregate average . .	55 4	40 2	22 11	35 3	48 9	45 8	
Same time last year .	43 8	35 11	21 9	30 1	41 0	38 11	

COMPARATIVE AVERAGES—1860-59.

From last Friday's Gaz.		s. d.	From Gazette of 1859.		s. d.
Wheat 62753 qrs.	51 5	Wheat 124600 qrs.	43 8		
Barley 91634 . .	38 7	Barley 92097 . .	35 1		
Oats 14317 . .	22 1	Oats 12693 . .	21 9		
Rye 152 . .	33 6	Rye 149 . .	30 0		
Beans 3137 . .	45 6	Beans 5135 . .	41 0		
Peas 1825 . .	43 8	Peas 2146 . .	38 9		

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT

PRICE.	Nov. 10.	Nov. 17.	Nov. 24.	Dec. 1.	Dec. 8.	Dec. 15.
58s. 9d.	..	..	..	..	..	..
58s. 1d.	..	..	..	..	..	..
56s. 3d.	..	..	..	..	..	..
54s. 10d.	..	..	..	..	..	..
52s. 7d.	..	..	..	..	..	..
51s. 5d.	..	..	..	..	..	..

MONTHLY RETURN.

AN ACCOUNT SHEWING THE QUANTITIES OF CORN GRAIN, MEAL, AND FLOUR, IMPORTED INTO THE UNITED KINGDOM, AND ADMITTED TO HOME CONSUMPTION, IN THE MONTH OF NOVEMBER, 1860.

Species of Corn, Grain, Meal, and Flour.	Imported from foreign Countries.		Imported from British Possessions out of Europe		Total.
	qrs. bush.		qrs. bush.		qrs. bush.
Wheat	94567 1		41456 4		985023 5
Barley	244126 5		—		244426 5
Oats	234390 6		79 2		234470 0
Rye	14455 0		—		14455 0
Peas	18294 4		25206 5		43561 1
Beans	46751 3		—		46751 3
Maize or Indian Corn	138825 4		—		138825 4
Buck Wheat	38 6		—		38 6
Bere or Bigg	—		—		—
Total of Corn and Grain	1643749 5		66802 3		1710552 0
Wheat Meal and Flour.	415186 1 21	69961 3 25			515148 1 18
Barley Meal	0 1 2	—			0 1 2
Oat Meal	17 3 18	1076 0 20			1094 0 10
Rye Meal	16362 0 19	—			16362 0 19
Pea Meal	—	—			—
Bean Meal	—	—			—
Indian Meal	11 0 16	—			11 0 16
Buck Wheat Meal	27 0 19	0 1 14			27 2 5
Total of Meal and Flour.	461605 0 11	71038 2 3			532643 2 14

PRICES OF SEEDS.

LONDON, MONDAY, Dec. 24.—The market for Seeds does not offer any new feature for remark, there being little or no business passing in any variety. Red seed is held firmly, and but few samples of the late arrivals are offered on the market. White seed is without business, as also are Trefoils, except choice qualities. Canaryseed is without inquiry, and low qualities are of very irregular values.

BRITISH SEEDS.

MUSTARDSEED, per bush., brown	11s. to 15s.
CORIANDEK, per cwt.	14s. 16s.
CANARY, per qr.	58s. 63s.
TREFOIL	18s. 25s.
TAKESS, winter, new, per bushel	8s. 10s.
LINSEED, per qr., sowing—s. to 64s. crushing. 54s. to 58s.	
LINSEED CAKES, per ton	£9 10s. to £10 10s.
RAPESEED, per qr.	70s. to 76s.
RAPE CAKE, per ton	£5 10s. to £6 0s.

FOREIGN SEEDS, &c.

CLOVERSEED, red 46s. to 64s. white 72s. to 90s.	
TREFOIL	78s. 28s.
HEMPSSEED, small, —s. per qr. Dutch —s. 48s.	
CORIANDEK, per cwt.	16s. 18s.
CARRAWAY	32s. —s.
LINSEED, per qr., Baltic 50s. to 52s. . . . Bombay 52s. 56s.	
LINSEED CAKE, per ton	£9 10s. to £11 0s.
RAPESEED, Dutch —s. to —s.	
RAPE CAKE, per ton	£5 0s. to £6 0s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, Dec. 24.—During the past week the arrivals, both coastwise and by rail, have been exceedingly large, and trade very dull, at a considerable reduction.

Lincolnshire Regents	100s. to 120s. per ton.
Daubar red-soil do	120s. to 140s. "
North Berwick do	120s. to 125s. "
Perth, Forfar, and Fife do	105s. to 115s. "
Ditto Rocks and Reds	90s. to 95s. "
French Whites	90s. to 100s. "
Belgian do	85s. to 90s. "
Dutch do	80s. to 85s. "

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Dec. 24.—Since our last report moderate supplies of potatoes have come to hand coastwise as well as by land carriage; whilst the imports have been confined to 274 tons from Rotterdam. A fair business doing.

York Regents	110s. to 130s. per ton.
Essex and Kent	110s. to 140s. "
Lincolns	100s. to 120s. "
Scotch	90s. to 140s. "
Foreign	80s. to 100s. "

HOP MARKET.

BOROUGH, MONDAY, Dec. 24.—Our market, as usual at this period of the year, is quiet. Prices remain firm.

Mid & East Kent	£6 0.	£14 0.	£18 0
Weald of Kents	4 0.	8 0.	14 0
Sussex	5 0.	7 0.	9 0
Yearlings	5 0.	7 7.	9 10

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.—		CHEESE, per cwt.—	
Friesland	104 to 116	Cheshire	new 72 to 84
Jersey	100 406	Cheddar	74 86
Dorset	—	Double Gloucester	68 74
Carlisle	100 114	HAMS	—
Waterford	100 114	York	78 82
Cork	100 112	Cumberland	78 82
Limerick	98 100	Irish	76 84
Sligo	100 114	BACON: Wiltshire, dried	68 70
Fresh, per doz. 14s. 0d. to 17s. 0d.		Irish, green	62 66

GLASGOW.—A very moderate supply of cheese for the season, but the trade very quiet. There were 9 tons passed the weigh-house scales, and 4 carts in the Bazaar. Prices steady. Early-made 59s. to 62s.; late and secondary, 52s. to 55s.; skim milk, 27s. to 29s. per cwt.

GLOUCESTER.—The supply was small, and very few buyers were present. Sale was rather dull. Best single 56s. to 60s. per cwt., seconds 48s. to 54s.

BELFAST, (Thursday last).—Butter: Shipping price, 100s. to 116s. per cwt.; firkins and crocks, 11d. to 1s. per lb.; Bacon, 63s. to 65s.; Hams, prime 78s. to 86s. per cwt., second quality 60s. to 66s.; Prime mess Pork, 92s. 6d. per brl.; Beef, 120s. to 130s. per tierce; uncured Pork, 54s. to 59s. per 120lbs.

WOOL MARKETS.

ENGLISH WOOL MARKETS.

LONDON, MONDAY, Dec. 24.—Since our last report prices of all kinds of home-grown wool have been well supported; but the demand has been wholly confined to limited quantities. For export, very little has been doing; nevertheless, as the stocks in the manufacturing districts continue light, holders have declined to press sales.

Per sack of 240lbs.

Fleeces—Southdown Hogs	£19 0	to £19 10
Do. Half-bred Hogs	19 10	20 10
Do. Kent	19 0	19 10
Do. Southdown Ewes & Wethers	17 10	18 0
Do. Leicester do.	17 10	18 0
Sorts—Clothing, picklock	20 0	20 10
Do. Prime and picklock	18 10	19 0
Do. Choice	17 0	18 0
Do. Super	15 0	16 0
Do. Combing—Wether matching	20 0	21 0
Do. Picklock	18 0	18 10
Do. Common	16 0	16 10
Do. Hog-matching	23 10	24 0
Do. Picklock matchig	18 10	19 10
Do. Super do.	16 0	16 10

BRADFORD WOOL MARKET, (Thursday last).—As usual at Christmas time, the wool market is in a very inactive state. Some staplers, indeed, report a rather improved inquiry over last week, but if there is any, it does not alter the tone of the market. There are still very few buyers, and little wool has changed hands. The currency of several weeks back is firmly maintained—bright-haired wools, for which, of course, there is most demand, being especially firm. The stocks on hand for the time of year are not an average. Noils and brokes are firm, and taken up as produced.—*Bradford Observer*.

LIVERPOOL WOOL MARKET, Dec. 22.

SCOTCH.—There is still only a limited demand for Laid Highland. Stocks are light, holders stiff, with prices looking forward to a better demand after the turn of the year. White Highland is scarce, and enquired for. Cheviot of a good class is in fair demand, while the lower classes are neglected.

	s. d.	s. d.
Laid Highland Wool per 24lbs.	11 6	13 0
White Highland do.	13 9	17 0
Laid Crossed do.	14 6	16 6
Do.	16 0	18 6
Laid Cheviot do.	19 0	22 0
Do.	22 0	28 0
White Cheviot do.	34 0	42 0

FOREIGN AND COLONIAL WOOL MARKET.

	Perlb.	s. d.	s. d.
German, { 1st and 2nd Elect.		3 4	4 6
Saxon, { Prima		2 4	3 0
and { Secunda		2 0	2 4
Prussian. { Tertia		1 8	1 10
COLONIAL:—SYDNEY—Lambs		1 3½	2 3½
Scoured do.		1 0½	3 2
Unwashed		0 10½	1 2
Locks and Pieces		0 10½	1 9
Slips and Skin		1 0	1 9½
PORT PHILIP—Lambs		1 3	2 8
Scoured do.		1 3	3 3
Unwashed		0 10	1 4
Locks and Pieces		0 7½	1 10½
S. AUSTRALIAN—Lambs		1 7½	2 1
Scoured do.		1 4	2 6½
Unwashed		0 9½	1 2½
Locks and Pieces		1 1½	0
V. D. LAND—Lambs		1 5½	2 3
Scoured do.		1 1½	1 10½
Unwashed		1 0	1 7
Locks and Pieces		1 1	1 8½
CAPE OF GOOD HOPE—Fleeces		0 8½	2 0½
Lambs		0 11½	2 1
Scoured		1 0½	2 2
Unwashed		0 8	1 6

MANURES.

LONDON, SATURDAY, DEC. 24.—1,670 tons of Peruvian Guano have come in during the week. Nitrate of Soda is still firm, with a demand. Linsed Cakes are sold at prices slightly more favourable to the buyer, the supply being greater, the imports this week having reached 1,327 tons. Rape and Cotton Cakes still very high and scarce.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from importers' stores, £12 5s. to £12 12s. p. ton. Bones, £5 to £5 10s. per ton; ditto crushed, £6 5s. do; ditto dissolved, £6 10s. do; ditto half-in 19s. to 19s. 6d. per qr.; ditto dust, 19s. to 20s. Animal Charcoal, (70 per cent. phosphate) £4 10s. to £5 per ton. Coprolite, Cambridge, whole 32s. to 44s., ground 54s. to 58s.; Suffolk, whole 35s., ground 46s. to 47s. per ton. Nitrate of Soda, £13 10s. to £14 10s. Gypsum, 30s. per ton. Sulphate of Ammonia, £14 10s. to £15 per ton. Sulphuric Acid, concentrated 1·845 lb. per lb., brown 1·712 0½d. Superphosphate of Lime, £5 10s. to £6 6s. per ton. Blood Manure, £5 5s. to £7 10s. per ton. Linsed Cakes, best American, £11 17s. 6d. to £12 5s. (brl.), ditto £11 10s. to £12 (bag); English £11 5s. to £12 per ton. Rape Cake, £6 15s. to £7. Cottonseed Cake, £7 47s. 10s. per ton.

E. PURSER.

London Manure Company, 116, Fenchurch Street, E.C.

LIVERPOOL GUANO AND SEED, &c. MARKET

DECEMBER 22.—Guano, import 1,500 tons of Peruvian, sales 500 tons of all kinds: Kooria Mooriat at £4 to £4 5s per ton, in bulk; there has also been rather more enquiry for other kinds. Nitrate of Soda is lower, 12s. 3d. accepted for common, but in quantity. Of Saltpetre, 3,000 bags of Calcutta and Bombay at slightly lower prices. Bone Ash, 300 tons offered at auction, none sold. Linsed Oilcakes in more request, and for American 5s. per ton advance paid. Cottonseed cakes steady, but buyers waiting for the auctions. The stock of Oilcakes is small, and a brief continuance of the frost will further enhance prices. Linsed quiet, but firm, at the quotations. Cloverseed as before. Tallow, 1st P.Y.C. at 12s. the quotations.

Guano, Peruvian £12 0 0 to £13 0 0	Linsed Cake per ton—
Do. Upper do. 5 0 0	American, bags £10 17 6 to £11 0 0
Ichaboe, per ton 0 0 0	Marselles nom. 0 0 0
Patagonian	0 0 0
Saldanha Bay	0 0 0
Kooria Mooriat	3 15 0
Pedro Keys	0 0 0
Sulphate of Am. 14 0 0	15 10 0
Bone Ash	4 15 0
Cloverseed, American	2 16 0
red, new, per cwt. 3 10 0	2 16 0

SAMUEL DOWNES, General Broker,

Exchange Court, Liverpool.

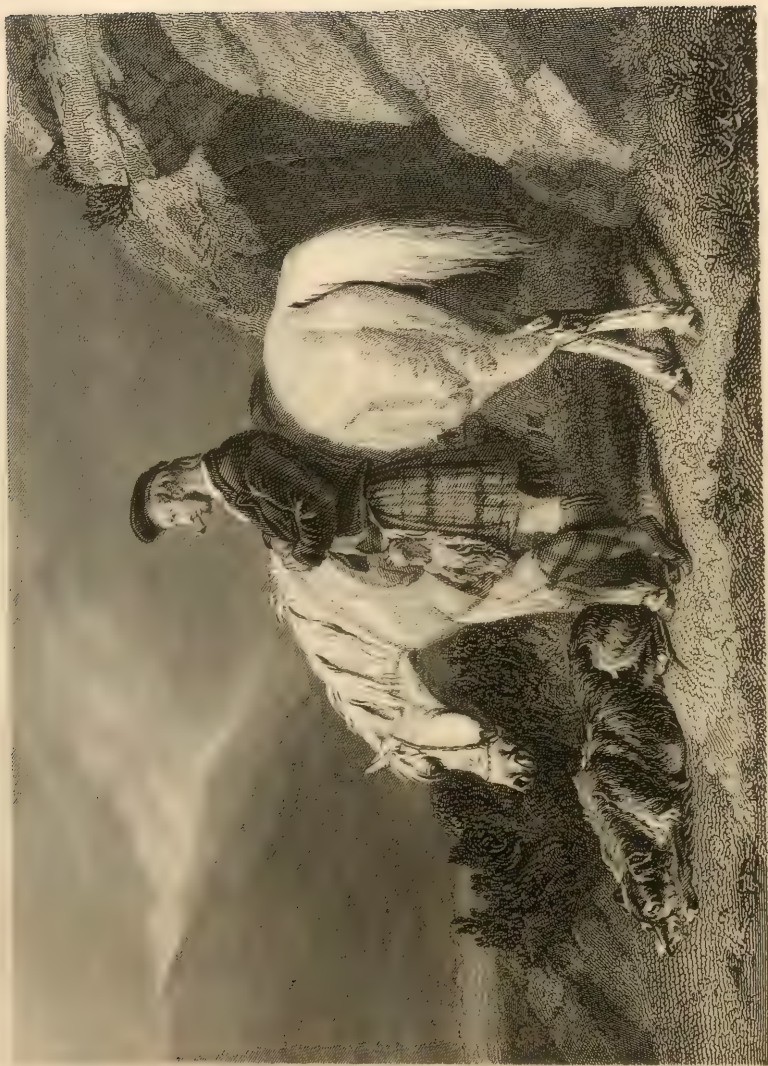
Agricultural Chemical Works, Stowmarket, Suffolk.	
Prentice's Cereal Manure for Corn Crops	per ton £5 10 0
Mangold Manure	8 0 0
Prentice's Turnip Manure	6 10 0
Prentice's Superphosphate of Lime	6 0 0

Manufactured by Hodgson and Simpson, Wakefield, and

Nitro-Phosphate	per ton £6 10 0
Ammonia-Phosphate	8 0 0

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THE FARMER'S MAGAZINE.

FEBRUARY, 1861.

PLATE I.

A DEVON STEER.

THE PROPERTY OF HIS ROYAL HIGHNESS THE PRINCE CONSORT.

This steer had the repute of being the first Devon bull-calf ever bred by His Royal Highness the Prince Consort. He was calved in October, 1856, at the Norfolk Farm in Windsor Great Park, where the Devon herd is kept, and was by Sultan (318) out of Crocus (1238), by Baronet (6), grandsire Quartly's Prince of Wales (105)—dam Violet, from Mr. Halse's herd.

Sultan (318), the first-prize Devon bull at Chelmsford, was by Earl of Exeter (38), another "Rôyal" winner at the great Show at Windsor in the Exhibition year.

Crocus was bred by Mr. J. C. Halse, of Moland; and her sire, Baronet, the first-prize bull at the Norwich Meeting of the Royal Agricultural Society, was bred by Mr. James Quartly.

At the Birmingham and Midland Counties' Fat Cattle Show, in December, 1859, this steer took the first prize of £10—with the silver medal to His Royal Highness as breeder—as the best Devon steer; Mr. Overman, of Burnham, taking the second prize, and the Prince Consort being commended for another steer. Lord Leicester had also a commended beast in this class.

In the week following, at the Smithfield Club Cattle Show, in the Baker-street Bazaar, the Prince's steer took the second prize of £10 in the all-aged Devon class, being beaten by Mr. Farquharson's "best Devon" of the Birmingham Meeting. Mr. Heath took the third premium, and Mr. Ball's beast was commended.

These were the only two occasions on which the Windsor steer was exhibited, and he was sold as he stood in the yard to Mr. Pawsey, of Bath. Tradition records him as a very neatly-formed animal; not standing high, but thick and full in his frame, and beautifully fed, with flesh very firm, and of exceedingly good quality.

The Devons we fancy are still the favourites at the Royal farms, as they certainly were on our going over them a year or two since; but they have been getting them a little too "fine" at home, and His Royal Highness is giving both the Short-horns and the Herefords a fair chance. The Messrs. Halse, from whose herd this steer was descended, have been breeders of good North Devons for the last half-century, using for the most part the best bulls of the late Mr. Francis Quartly, and since his decease those of Messrs. James and John Quartly. Some years since Mr. Philip Halse was compelled to fatten many of his cows and heifers, from their continuing year after year to slip their calves. The cause was thought to be the offensive smell proceeding from the "mundic" of some mines worked in the neighbourhood. As a consequence he did not for some years exhibit, but he has now again got up a good herd, and during last season came out once more a winner, having the first and second yearling heifers at Canterbury. Mr. John C. Halse has shown very seldom at the agricultural exhibitions, but when he has done so he has generally been a winner. He has only exhibited twice at the Royal Meetings—at Chelmsford and Salisbury. At the former he took the second prize in the young bull class with the Earl of Essex (407), subsequently sold to the French Government; and at the latter Show he gained the second prize with Sultan Junior (530). He has also been twice to Birmingham, carrying off on the first occasion the first prize and silver medal, for the best young steer; and, in 1857, another first prize and silver medal with Fancy (708), as the best fat Devon cow. Of course Mr. Halse is yet better known at the West of England Meetings.

PLATE II.

A QUIET PIPE.

Here's our friend Donald enjoying his bit of 'bacca, without a chance of annoying any one—not even of offending the deer if they sniff the taint in the pure mountain air. They might rather, indeed, take it as a kindly warning to keep at a respectful distance from old Oscar, who generally sleeps with one eye open. How different it would have been, if, instead of the short clay, the Highlander had been amusing himself with another kind of pipe—those abominable, noisy, screeching things, that would have cleared the country of every living creature or crawling thing within miles

of him! Often have we, when jogging along at early dawn, "run" a labourer, a begging sailor, a gipsy, or a travelling tinker, with his short pipe, for a mile or two, before coming up to him—delighting in the fumes, and thinking what are "mossy violet with their odoriferous exhalations" to the fragrant tobacco, as it is wafted, on a sharp morning, from the black dudeen of the working man? There is moderation in everything, and a pull or two at his pipe has made many a philosopher to think the lighter of his cares, and the better of his fellows.

A DROP OF RAIN-WATER.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

We are often, but erroneously, said by foreigners to be far too attentive to the weather—that it is too often the leading topic of our conversation; but if the remark had any foundation it is hardly a matter of surprise, as we have more reason than most nations for having our thoughts thus directed; we are more dependent upon the weather for our food than those blessed with more certain seasons; our corn, our vegetables, our fruits, are all natives of other and warmer lands; we can only preserve by very great care and skill what nature spontaneously produces in more southern soils, and under a more serene climate. We are all, therefore, whether gardeners or agriculturists, deeply interested in atmospheric transitions in temperature, and in the degree of moisture to which our plants are exposed. It is but rarely, however, that we inquire of the *origin* and *history* of the meteorological phenomena which encircle us. The research might, however, be attended with more profit than we may at first suspect. It is with that conviction that I propose in this and a subsequent paper to endeavour to trace the history of a drop of rain-water.

The *origin* and *progress* of a drop of rain is a history of many things which relate not only to our comfort and enjoyment, to the growth of the vegetable world, but to our very existence. We do not commonly inquire about such matters; we have always been used to see the rain descend; there is nothing novel about it, to cause us to search as to its history—why it falls upon our fields, whence it comes, or where that water proceeds in its course when it disappears in the earth from our sight? We do not engage in such examinations, because the phenomenon is neither novel nor startling; the fall of a meteoric stone arouses more

attention, although we can neither discern its origin nor its usefulness, than all the rain-drops, which we well know spread the oil of fatness so continuously over our fields. Could our lot have been cast in a totally rainless district, like that of the Chincha or Guano Islands, on the Peruvian coast, our wonder would have been considerably excited when first placed in a shower of rain—our inquiries about its origin more fervid, our gratitude to its great Author more deep. It may be useful, then, if we travel together with an imaginary inquirer of this kind, who has everything to learn with regard to a drop of rain-water, and is anxious to find its origin, its nature, and why and whence it disappears or evaporates.

The size, shape, and composition of a drop of rain seem to be naturally the first portion of our inquiry. Its size varies from the very smallest, say 1-25th to about $\frac{1}{4}$ of an inch in diameter; its shape is spherical. An early reflection presents itself when we are considering the size of a drop of rain—the beneficence of its Divine Architect in adapting the weight of those rain-drops to the wants and safety of His creatures. Falling as they do from a great elevation, they descend with a force which, had they been considerably larger, would have spread death and destruction in every shower. We all know the painful effect produced upon our heads by a rapidly-descending current of water, or when a few small drops of rain are congealed together by a low temperature as they descend from the clouds, and hailstones formed. In our driest summers, it is true, we may desire, in figurative language, "torrents" of rain upon our languishing crops; but no one wishes to receive rain-drops as large as turnips, or rain falling in columns. A prayer for a hailstorm was perhaps never yet uttered.

We see, then, that even the rain-drops were weighed by their Divine Author, their gravity adapted to the powers and good of His creatures, and the bed of earth on which they were to descend and fertilize. The mean annual fall of rain on the entire surface of the earth is estimated at about five feet (Maury, *Phy. Geo. Sea*, 207); but the amount of the average annual fall of rain varies, however, widely in different countries, from the districts of the Andes, where the rain rarely ceases, to those not a hundred miles distant, around Lima where rain is almost unknown.

In our quarter of the globe, the annual rainfall varies with different countries, altitudes, and exposures to moist westerly currents. At Madrid, which is placed on an elevated plateau, the annual rainfall is only about 10 inches. At Coimbra, in Portugal, a fall of more than 200 inches has been recorded. Extraordinary rainfalls have occurred occasionally in the South of Europe. On October 25, 1825, 32 inches fell at Genoa, and October 9, 1827, at Joyeuse, in the south of France, 31 inches fell. In the East Indies 13.06 inches fell at Mahabuleshwur, September 2, 1833; but 11 or 12 inches is not rare. In July, 1840, 134.42 inches fell at that station. At Bombay, July 1, 1844, 7.44 inches fell in twenty-four hours, 2 inches falling in seventy minutes (*ibid.*, p. 366). In England our rainfalls do not nearly approach amounts like these. Mr. E. J. Lowe has recorded the most rainy months and days at Beeston, near Nottingham, from 1843 to 1857:—

MOST RAINY MONTHS.

		Inches.
1852, November	.. ..	7.0
1852, September	.. ..	5.3
1849, September	.. ..	5.0
1847, May	.. ..	5.0
1853, June	.. ..	5.0

MOST RAINY DAYS.

1843, August 9	.. ..	1.095
1846, October 19	.. ..	1.300
1847, May 8	.. ..	1.645
1848, June 18	.. ..	1.055
1848, July 21	.. ..	1.155
1849, September 28	.. ..	1.335
1850, July 25	.. ..	1.084
1851, July 24	.. ..	1.160
1852, July 26	.. ..	2.063
1852, September 6	.. ..	2.044
1853, August 17	.. ..	1.502
1855, July 14	.. ..	1.060
1857, June 30	.. ..	1.590
1857, August 13	.. ..	3.010

In our country, the smallest rainfall is in Essex, which hardly averages 20 inches. The largest is in the westerly counties, where it ranges from 35 to 46 inches. On some of the mountains in Westmoreland 108 to 148 inches have been recorded in one year.

ITS ORIGIN AS VAPOUR.

Having noted the fall of rain—seen it descend from the clouds—the next portion of our inquiry is, How did that rain water get into the atmosphere? We need hardly be reminded that it was by the

evaporation of water from the earth's surface. "To evaporate," observes Maury, in his valuable work on the Physical Geography of the Sea, "water enough annually from the ocean to cover the earth to a depth of five feet with rain-water, to transport it from one zone to another, and to precipitate it in the right places at suitable times and in due proportions, is one of the grand offices of the atmosphere." This water is evaporated chiefly from the torrid zone. Supposing it all to come thence, to raise as high as the clouds, and to lower down again, all the waters in a lake sixteen feet deep, three thousand miles broad and twenty-four thousand long, is the annual business of this invisible machinery. Well may we exclaim, What a powerful engine is the atmosphere! And how nicely adjusted must be all its cogs, and wheels, and springs, and compensations, that it never wears out, or fails to do its work at the right time and in the right way! "According to Laidly," adds Maury, "the evaporation at Calcutta is about 15 feet annually; between the Cape of Good Hope and Calcutta it averages, in October and November, nearly three-quarters of an inch daily; between 10 and 20 degrees in the Bay of Bengal it was found to exceed an inch daily. The South Seas then should supply the atmosphere with watery vapour, while the northern hemisphere condenses it. We should therefore have more rain in the northern hemisphere. The rivers tell us that we have, for the great water courses of the globe, and half the fresh-water in the world, are found on our side of the equator. The rain gauge also tells us the same story. The average fall of rain in the north temperate zone, according to Johnstone, is 37 inches: he gives but 26 inches in the south temperate. The observations of mariners corroborate this conclusion. Rains, fogs, thunder, calms, and storms, all occur much more frequently, and more irregularly on this side, than they do on the other side of the equator.

Let us begin our examination by finding out the ordinary amount of vapour present in the air, and with what gases it is mixed. The composition of the atmosphere, at a mean temperature and pressure, is as follows:—

	By measure.	By weight.
Nitrogen gas	77.5	75.55
Oxygen gas	21.0	23.32
Aqueous vapour	1.42	1.03
Carbonic acid gas	0.08	0.10

Whoever wishes to see that aqueous portion of the atmosphere made apparent to his senses, need only introduce a glass of very cold-water into a warm well-tenanted room—the vapour of its atmosphere is immediately condensed on the glass. It is not, as is commonly said, the heat of the air, but its warm aqueous vapour, that strikes, that is condenses upon the glass.

The state in which water exists in the atmosphere seems now pretty well determined. It was formerly supposed, by the majority of philosophers, that it was in a state of chemical combination with the atmospheric gases; but later researches seem to show that it is in the state of steam. Saussure long

since had shown that the amount of steam existing in a given space and temperature is the same, whether that space be free from or filled with air; and then Dalton distinctly proved that the vapour of water mixed with air, or other gas permanent over water, differs in no respect from pure steam, and is subject to the same laws. The aqueous vapour of the air constitutes, in his opinion, a distinct and independent atmosphere, the elastic force of which forms at different temperatures different proportions of the elastic force of the whole. For example, at the temperature of 65 deg. it gives to air 1-50th of its elasticity. According, therefore, to this view, which is confirmed by the experiments of Gay Lussac and others, a volume of air, or gas, at any temperature, saturated with moisture, contains as much steam as would exist, at the same temperature, in a vacuum of the same extent.

The insensible vapour in the air we may then conclude is merely mechanically mixed with the atmospheric gases; there is no chemical combination. It is the diffusion of water in the state of steam, produced by the evaporation from the earth's surface. This evaporation is hardly ever interrupted; it continues very often even when rain is falling, or the ground covered with snow—under the burning sun of the equator, or in the eternal ice of the arctic regions, it still proceeds. It is, indeed, remarkable, as the Rev. L. Jenyns observes ("Meteorology," p. 164), that evaporation still goes on when water is frozen, the same as when it is liquid: even the most intense cold is insufficient of itself to put a stop to it. This circumstance often strikes persons with astonishment who witness it in its effects without being aware of the true cause. They see a fall of snow gradually waste—if light, wholly disappear—or a block of ice sensibly diminish during the continuance of a frost, especially if the wind blows tolerably fresh from some point towards the north, without the least sign of liquefaction on the surface. And they perhaps naturally enough wonder what has become of it. Sometimes also in deeper snows the surface becomes curiously grooved or channelled, by the wind acting unequally on it, and thus promoting unequally the evaporation. This phenomenon is best observed around the trunks of trees, and near the interstices of palings, or wherever a stream of air acquires an increased force in a particular direction. There is every reason to conclude with Dr. Prout, that the quantity of vapour thus formed from snow and ice is precisely equal to what would be evaporated from water itself, provided water could exist as a fluid below the temperature at which it is congealed.

The amount of water in the air, from an average of seven years' observation at the Greenwich Observatory during each month of the year, has been given by Mr. J. H. Belville, in his "Manual of the Thermometer."

In the following table, column I. gives the mean weight, in grains, of vapour in a cubic foot of air at 9 o'clock a.m., and column II. the amount at 3 o'clock p.m. Column III. gives the mean addition of vapour required for complete saturation of a cubic foot of air at 9 o'clock, and column IV. the amount needed at 3 o'clock.

	EXISTING AMOUNT.		DEFICIENCY.	
	I. 9 A.M.	II. 3 P.M.	III. 9 A.M.	IV. 3 P.M.
January..	2'70	2'84	0'17	0'30
February.	2'58	2'72	0'25	0'62
March ..	2'77	2'85	0'40	1'05
April ...	3'26	3'37	0'68	1'41
May	4'02	4'06	1'10	2'04
June	4'71	4'78	1'45	2'42
July	5'07	5'26	1'50	2'27
August ..	5'00	5'07	1'18	2'27
September	4'66	4'77	0'73	1'93
October..	3'96	4'01	0'35	1'08
November	3'27	3'42	0'22	0'55
December	2'78	2'89	0'17	0'37

The amount of water which the air contains, let us remember, increases with its temperature. The mean relative humidity of the air, Mr. Belville observes, is greater at 9 a.m. than at 3 p.m.; the mean quantity of vapour in this time actually *increases*, but as the increase is *not* in proportion to the increase of *temperature* in the same interval, the air is relatively drier.

November, December, and January are the months when the air is most frequently saturated with vapour; as spring advances the air becomes warmer, and the point of saturation farther removed.

A cubic foot of atmospheric air, when saturated with water at the temperature of 66 degrees, contains only about eight grains of water. Dalton calculated that the medium quantity of vapour held in solution at once in the atmosphere may amount to about one-seventieth of its bulk.

That vapour we have seen is mainly supplied by the evaporation of the surface of the ocean; but the land contributes a large proportion: the vegetable and animal worlds do the same. First as to the portion yielded by the land, the amount of water evaporated from its surface has been examined by various experimentalists. Schubler conducted his trials on the small scale, with different earths exposed in trays to the sun and winds (*Journal R. A. S.*, vol. i. p. 177). He found that the difference in the evaporation from the surface of different earths was not so great as might have been anticipated. He determined that when a given surface of calcareous sand lost by evaporation during four hours 146 parts, an equal extent of fine garden-mould lost 143 parts, some black turf soil 128 parts, and two specimens of clay soil each lost 123 parts.

Some years after Schubler's experiments, Mr. Dickenson (*ibid.* vol. v. p. 151) examined the amount of the annual evaporation from the chalk soils of Hertfordshire. The following were some of the results he obtained in 1842 and 1843:—

	1842.	1843.
Depth of rain in inches	26.43	26.47
Evaporation	14.7	18.37
Filtration	11.76	8.10

In the same years, on the limestone soils of Yorkshire, Mr. C. Charnock obtained the following results (*ibid.*, vol. x., p. 517):—

	1842.	1843.
Depth of rain in inches	26.11	24.9
Evaporation	21.56	26.11
Filtration	4.55	4.28

It is noticeable from these trials how much greater is the evaporation from the limestone than from the chalk; and how much less the drainage. The winds produce a far more considerable amount of evaporation than the mere heat of the sun. The marine-salt makers, who expose sea-water, in very shallow ponds, to the action of the atmosphere, are well aware how much faster the Summer breezes evaporate the water than the sun on a still day; every washerwoman is aware of the same fact. Mr. Charnock experimentalized upon this question; he found that—

	1842.	1843.
The annual evaporation from water to both the sun and the wind was, in inches	33.61	34.17
From water exposed to the wind, but shaded from the sun	22.48	22.72
From a drained soil	21.56	20.11
From a soil saturated with water	30.02	31.19

But it is not only the surface of the earth and its waters from whence the insensible moisture of the atmosphere is derived. Plants contribute, and copiously too, to the supply. It is certain that plants of all kinds exhale moisture in large proportions. Mr. G. Phillips (*Jour. R. A. S.*, vol. vii., p. 306) found that a polyanthus, placed in a pot of earth, between the 28th of February and the 14th of April, 1845, evaporated 2.01 grains of water daily for every square inch of the surface of its leaves, and the mould 10.8 grains for every inch of surface: he found that a fine day, with sun and wind, always promoted evaporation, while a dull cold day always retarded, or stopped it. The evaporation from the leaves of a potato, under similar circumstances, was much less, being at the rate of only 1.4 grains per day for each square inch of surface. The transpiration of moisture from plants increases progressively from March to August, after which period it declines. It is the most copious from sunrise till noon, after which hour it lessens. Other plants emit moisture at a much greater rate than the polyanthus or the potato. Hales found that the sunflower transpired, in July and August, 15 grains of water from every square inch of its surface; a cabbage, under favourable circumstances, has been found to emit, daily, water equal to its own weight.

Need we attempt to calculate the enormous amount of aqueous vapours which the vegetable world thus contributes to our atmosphere? the whole covering of our Emerald Isles pouring in an incessant stream of moisture; the vegetation of all lands contributing their portion. The dense steaming forests of the equatorial regions adding perhaps the largest amount in a given space; enormous, though insensible streams, rivalling in their

weight of water those of the Amazon and the Mississippi. From the vegetation of the whole world in every clime, in every soil, and at every altitude, from the level of the sea up to the lines of eternal snow, by day and by night, is this outpouring going on; no winds prevent its continuance, by no change of temperature is this invisible stream of watery vapour entirely stayed.

But the emission of vapour into the air by the surface of the earth, its waters, and its vegetation, are not the only sources of the supply of atmospheric moisture. All animals contribute a considerable share. As I have elsewhere had occasion to remark, the evaporation from the surface and from the lungs of animals is very considerable: it varies, however, in different species and individuals. Cruickshank calculated it, from his experiments, to average about 7 pints, in a man, during the 24 hours; Lavoisier and Seguin made it amount to only $3\frac{1}{4}$ pints, the maximum being 5lbs., the minimum $1\frac{1}{2}$ lbs. They calculated that, in every 18 parts of water thus evaporated, 7 parts were from the lungs, and 11 from the skin. Its amount is increased by drink, but not by solid food. Its minimum amount is immediately after a meal, and in close, foggy weather: it attains its maximum during digestion. It is, as might be expected, the most considerable in warm and breezy weather, in hot climates, and after great exercise. This is indicated by the enormous quantity of liquid consumed by those who labour under such circumstances; the daily 14 pints of beer, the 24 pints of cider, allowed to the reapers (*Jour. Roy. Ag. Soc.*, vol. xiv., p. 445); and by the 30 pints of porter swallowed by the London coalwhippers—an amount which is often unequal to the loss they sustain by transpiration. The evaporation from a labourer, in certain situations, is, in fact, enormous. Dr. Southwood Smith made some observations upon the men employed in emptying and filling the retorts at the Phoenix Gas Works. These men are thus engaged for one hour twice a day. On a foggy day in November, when the temperature of the external air was 39 deg., the greatest loss of weight by these men, in an hour and a quarter, was 2lbs. 15 oz.; and the average of eight men was 2lbs. 1 oz. On a bright day in the same month, when the temperature of the surrounding air was 60 deg., the greatest loss of weight was 4lbs. 3 oz., the average loss being 3lbs. 6 oz. On a bright, clear day in June, the greatest loss sustained in the hour, by a man who had worked in a very hot place, was 5lbs. 2 oz.; the average of all, 2 lbs. 8 oz.

Such are the chief sources of the vast fountains of vapour which replenish the atmosphere with the water, that we shall presently trace becoming visible to our senses, in clouds, in dew, and in the rain-drop. The atmosphere in which we are enveloped, and in which, and by which, we live, is, indeed, full of marvels abounding with evidences of design, and the benevolence of its Creator. It is such testimonies that our readers may profitably study, not only in their fields, but by their study-fire; and as an able American author, whom I have before quoted, remarks, in one portion of his excellent work, "to him who studies the physical

relations of the earth, sea, and air, the atmosphere is indeed something more than a shoreless ocean, at the bottom of which he creeps along. It is an envelope, or covering, for the dispersion of light and heat over the surface of the earth: it is a sewer into which, with every breath we exhale, we cast vast quantities of dead animal matter: it is a laboratory for purification, in which that matter is recomposed, and wrought again into wholesome and healthful shapes: it is a machine for drawing up all the rivers from the sea, and conveying the

waters from their fountains in the ocean to their sources in the mountains: it is an inexhaustible magazine, marvellously adapted for many benign and beneficent purposes. Upon the proper working of this machine depends the well-being of every plant and animal that inhabits the earth. Its movements, therefore, cannot be left to chance. They are guided by laws that make all parts, functions, and movements of the machinery as obedient to order, and as harmonious, as the planets in their orbits.

SEWAGE IRRIGATION.

SIR,—The effectual drainage of towns is so intimately connected with the wellbeing of society in a monetary, sanitary, and social sense, as to render any attempt to utilize urban excreta not only a question of great public importance, but of great public utility.

The source of pollution, and often of pestilence, from the mephitic exhalations of stagnant masses or sluggish streams, the difficulty has been to render it available at rates at which it could be used for arresting the loss of alkalies absorbed by the soil in the ordinary course of cropping.

Its value as a manure is unquestionable. The only question is one of application—of elimination as a friable manure on the one hand, or fluid manure, either pure or deodorized, on the other.

It is contended that elimination can only be effected at a sacrifice of the more essential elements of fertility contained in the fluid portion of the mass, which is perfectly compatible with analytical results; while those who have used it moulded into bricks for the convenience of transit, characterise it as only so much "saï" earth, adding little or nothing to fertility.

Used as a fluid manure it is not open to these objections. Retaining the essential elements of fertility until absorbed by the soil, it is not only more readily elaborated and absorbed by vegetation than friable manure, but has the additional advantage of compensation for the loss of ammonia to which rain is subject before reaching the soil.

Its mode of application is both easy and free from engineering difficulties. Brick drains or glazed pipes for the purposes of draining, and impermeable reservoirs, mains, flags and stand pipes along the roadways and cross-roads, are the appliances.

But any attempt to traverse adjoining lands either with pipes or open drains will inevitably result in failure, as a fixed charge per acre would be regarded by the consumers in the light of an additional rent, and effectually mar the object in view.

Consumption would necessarily vary in particular instances, according to the state of the season, the nature of the crop under culture, and amount of moisture retained in the soil relatively to underdraining or otherwise.

Carried within easy range of the consumer, the masses

of irrigation would be left to the ordinary course of supply and demand. It could then be carted from the nearest stand-pipe as occasion required, and yield a larger revenue than any uniform system of rating that could be adopted.

The sewage of the metropolis applied in this way, allowing the population to amount to three millions, would be equivalent to a minimum irrigation, an inch deep, per annum, of upwards of two million acres; or an area 58 miles square, and supplied at the rate of 1,000 gallons or over 4 tons for a shilling, would yield a revenue of £1,642,500 per annum, representing a capital at 5 per cent. of £32,850,000.

Croydon—where, I believe, a company has already been formed—with a population, according to the last census, of 20,013, now probably about 25,000, would be equal to the irrigation, at a minimum depth of an inch, per annum, of 18,331 acres, or an area $5\frac{1}{2}$ miles square, equal to a revenue of £13,678 per annum, or a capital at 5 per cent. of £273,750.

Carlisle, with a population in 1851 of 26,310, augmented to 30,000, would irrigate 21,997 acres per annum, at a minimum depth of an inch per acre, or an area 6 miles square, and yield a revenue of £16,425 per annum, equal to a capital at 5 per cent. of £328,500.

Brighton, having adopted the Local Management Act, with a population in 1851 of 69,673, now say 80,000, would be equivalent to the irrigation of 58,660 acres, an inch deep, per annum, or an area $9\frac{1}{2}$ miles square, and yield a revenue of £43,800 per annum, equivalent to a capital at 5 per cent. of £876,000.

Birmingham in 1851 contained a population of 232,841, which, increased to 300,000, would irrigate 219,975 acres per annum, at a minimum depth of an inch per acre, or an area $18\frac{1}{2}$ miles square, equivalent to a revenue of £164,250 per annum, or £3,285,000 capital at 5 per cent.

Leeds, Liverpool, Manchester, and other towns and cities, in proportion to population, discharge, and depth of irrigation. While the population of the three kingdoms, taken at thirty millions, would be equivalent to the irrigation an inch deep per annum of about twenty-two million acres, or less than half the acreage in cultivation, or area of upwards of 586 miles square, and yield a revenue of $16\frac{1}{2}$ millions sterling per annum

representing a capital at 5 per cent. of 328½ millions. It has been proved by experiment that the soil acts as a deodoriser, and no other effects or noisome effluvia would arise from its application than arises from the

most ordinary bucolic odours; but if deodorization be insisted upon, it could be effected with a cheap mineral acid.

I am, sir, your obedient servant,

F. C. M.

THE DRAINAGE OF TOWNS.

SIR,—There are few subjects that have been more misrepresented than this one. Well-meaning people, from seeing the wonderful effects that the drainage from a dunghill produced, jumped to the conclusion that the inky flood from London or any other large town would “go and do likewise.” I once asked a first-class fruit-grower and market-gardener why he did not appropriate, honestly or dishonestly, the contents of a drain that ran through his ground? and he told me his reasons for not doing so; but I saw, by the heaps of London dung that he had purchased, that his ideas were quite clear as to the vast importance of London dung and drainage from London stables. Some time ago I was shown a pamphlet written expressly for the “Health of Towns,” giving the opinions of all our leading men upon the subject, to the end that the filth might, by its value, at least carry itself off free of charge, even if it did not leave a large profit to the scavenging department of the town.

It is not my intention to find any fault with this treatise, beyond stating that, as water is an excellent manure of itself, it is very easy to deceive well-informed people on the somewhat obscure subject of manure-water. Irrigation with certain waters alone has produced very heavy crops of hay and aftermath for twenty years consecutively. I mention this to show how easily such a case could have been handled, had it been a sewer that supplied the water, and not a spring. The food of plants has, indeed, to be broken fine—yea, very fine indeed—for them; for if the atom of food were large enough to be seen by the naked eye, on white paper, you might as well offer the plant half a brick to eat. It is therefore clear that liquid manure, from the bare fact of its being diffused, spread, broken to atoms, is in the best form to feed plants; but plants can be poisoned as easily as they can be fed; and, as none but God can create, all that we can do is to put together the materials out of which we expect the result, or, in other words, to manure for our crops according to the nature and wants of the said crops.

In manuring for grass, we must consider that under the general name of grass we find the meadows growing weeds of all kinds as well as *gramineæ*. I shall just quote one example, to show the absurdities of the name of “natural grass.” Under the ruined castle at Nottingham, in the “meadows rich” where “heifers low,” I observed the grass to be a completely matted sward of autumn crocus (*Colchicum autumnale*). Consult any botanical work, and you will see what the “virtues” of such a crop are. Plants indigenous to such places cannot fail to be highly benefited by the sewer-water, diluted more or less by floods scattered warping fashion over

them, just as the Egyptian corn lands get their annual sliming and soaking by the gigantic irrigation from the Nile.

The dye-water from such a town as Leek (a small town) damages the Charnet water for all practical purposes of irrigation. Leicester, again, is an unprofitable example of a dyer's town dealing with its own wash to make it pay. Carlisle sewerage is now in able hands, and, coming nearer to rational principles, may lead to simpler and more natural ideas of dealing with dirty water.

“In the multitude of counsellors there is wisdom;” and although the eminent men already in the field may know everything, it by no means follows that one tithe of their knowledge will ever get a fair trial in actual practice—first, on account of costs; and frequently on account of fixed laws, such as levels being dead against them. A city set upon a hill would give, no doubt, great facilities for disposing of its dirty water; but the natural arteries of water-conveyance have generally laid our large towns along both banks of some river, once clean, no doubt, but not in our day. “The river,” lackaday! has been canal and common sewer for half a century.

It is to the part of the sewer-water that can be kept out of the main artery of the river, that I now beg leave to direct attention, and to apply the natural scavengers, that have always done this sort of work gratis, and are now doing it at a very high expense, where their artificial services are wanted.

I am not going to enumerate from “Loudon's Catalogue” a list of hard names, but shall quote about three or four of the most familiar plants in cultivation; and when you have heard the history—the real *natural history* of these, many will no doubt wonder why we have not had these common-sense ideas long ago in “Mawe's Gardener,” and others.

The “mud-larks” that we read of in old times, such as the Jews in their Egyptian servitude, whilst on the ground moulding and burning brick, were evidently delighted with the onion tribe, which they must have got pretty freely, for they murmured for want of this more than for anything else—or, in other words, the article must have abounded; as well it might, where such mud-works were in existence, for we find that the natural localities of the *Alliums* are, for example, on the banks of the Thames opposite Kew Gardens, and on such-like localities. Indeed, the composition of the onion, and the character of its feeders, would all point to the deep, soft, rich banks of some slough or muddy stream, where, like the oyster, it might feed itself on town-wash. When I have put manure three feet deep for onions,

they always bored, and found it of course. They will go three times that depth, as has been often proved. Still, let no one imagine that onions will grow in such as an osier-bed; but the filth of towns will be rich food for such a foul-feeding genus as *Allium*, and instead of our supplies of these plants being drawn from high dry or shallow ground with heavy manurings, they should get their natural *habitat*, and eat up for our life and health what would otherwise produce disease and death. Celery is another denizen of the dirt; it is an aquatic plant, and poisonous, growing naturally in muddy shallow water. I need not say more of celery, as it is a very unmanageable crop; still, the mud is its natural place, and I could not pass it unnoticed, as it is evidently only in its infancy yet, as regards quantity: being a great luxury, it will always sell if it could be grown cheap enough. But the great scavenger of all is the rhubarb.* This plant comes into the world with its helmet on, ready for the season. Should a few inches deep of thick filth settle over its crown, no matter; and should a couple of fathoms of flood-water cover that, still the rhubarb is dormant and dry, biding its time; but when the waters subside, and sunshine warms the soil, the rhubarb raises its nightcap; and when you see that it had no seam, there is no question as to its mission being to keep the crown dry and free of rot during the winter, under water. Now let us see what abilities this plant is endowed with, to grapple with the filth in which he dwells. Rapidity of growth beyond all precedent—spread of foliage, as if half-a-dozen umbrellas were attached to each crown to elaborate the effluvia into food. The acidifying agency of the atmosphere upon all the heterogeneous swill is here met by a plant requiring such an amount of acid as would puzzle all the chemists and agriculturists to find the supply; hence in less favoured spots the rhubarb is small in size, and woody in texture, just because it had not its building materials at hand, being what Sir Joseph Banks would have termed (a weed), “a plant out of its place.” If a thousand acres more or less were laid down in rhubarb, in such localities for example as the down and dell land under Leicester and Carlisle (I mention these because they are before the public on their trial trips), the quantity of human food so produced, from the human filth already there, would be such a change as would

amply repay the cultivator as to the raising of any amount of dirty water to a higher level for the purposes of cultivation; that is a subject already settled, and one has only to look at our mines, and the water raised to feed our canals, to see what can be done in this way. I need not say that the deposit will very soon raise the land to enable quite a new character of plants to inhabit it: for only a few inches higher, and we have the region of sour apples, the Isleworth market-garden style of first-class fruit trees; but I do not intend to touch upon ulterior subjects: I would simply grapple with the mud, and set the natural scavengers to store it in their botanical sacs, just as we see swarms of filthy grubs devouring the hundreds of tons of seaweed cast upon the beach after a storm: they eat it, and take wings and fly away, if they are lucky enough to get out of the reach of fish and fowl. God hath so arranged order and cleanliness, that the place for filth is a little way under ground, and there in darkness the plant preys on it, and the beautiful green mantle which gladdens our hearts in the sunshine is the produce of this lower charnel-house reanimated for our support, and wearing a cheerful and inviting aspect as becometh the Giver.

The alder, for its rods and for its wood used in the turnery business, may be mentioned in passing, as it is really at home only in the mud bank; but the willows, salallows, and their nearly allied species, the poplars, are as a group the wholesale carriers-off of converted river mud. An osier bed is not worth owning, unless it gets warped or flooded annually, so as to let the deposit of its own fallen foliage and other vegetable matter get to it as manure. To see the great value of willow-rods occasionally obtained from some worthless swamp—worthless as regards the cultivation of ordinary farm crops, but still a money producing and highly remunerative crop to those who have suited the crop to the locality; and this is precisely what I am aiming at, to set the mill to work that can convert the natural or the artificial swamp, the land within reach of irrigation by the swill of towns, into a remunerative plantation of plants adapted by nature for that end.

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THE BEST MEANS FOR IMPROVING THE DWELLINGS OF THE LABOURING CLASSES.

Another agricultural truism is fast coming to be admitted. If it “pays better” to keep stock in warmth and comfort than to suffer them to be ill-housed and starved, the same system is found to be equally applicable to the man who looks after them. John

Leech's companion sketches will long outlive the mere number of *Punch*, and suggest many a home question to the landlord with a “proper pride” in his stables and his homestead. As we heard one say, as he stood in just such a box as that in the print, “How

* The name “rhubarb” (*Rheum raphanicum*) is derived from Rheum Rha, the Volga, a river in Russia, overflowing its banks often, and depositing the swill of some hundreds of miles gathering from the towns situated on its banks, and those of its tributaries. The rhubarb is a native of this locality,

where its immense fleshy underground stems, highly charged with yellow colouring matter and high medicinal qualities, luxuriates in the deep alluvial deposits disintegrated from all the elements of town and country life.

many a poor fellow in the Crimea would jump at such a berth as old Sancho has here!" The apt rejoinder now would go to ask whether it was really necessary to seek so far a-field for this poor fellow? Might we not find many such, almost within hail of where we stood—Christian, able-bodied English men, who were not half so well cared for in their own homes as the horses they groomed or the beasts they fed? The truth of all this is gradually becoming revealed. The Press takes up the matter; the farmers turn again to its discussion; and the Premier of England himself presides at a meeting, the special object of which is to adopt some plan for amending this long neglected abuse.

A meeting had just been held at Romsey "for the purpose of taking into consideration the best means of improving the dwellings of the labouring classes." Lord Palmerston took the chair, and nearly all the landlord proprietors of the district were present. His Lordship introduced the business of the day in a few brief sentences, and was followed by the Right Honourable W. Cowper, M.P. and Chief Commissioner of Public Works. In the course of a very eloquent address, Mr. Cowper thus ably dwelt on the evil and its effects: "It is wonderful how much the mere influence of the house he lives in acts both upon the mental and physical condition of the labouring man. If the house is built with walls too thin, if the outer-door opens into the living-room, so that every time the door is opened there is a rush of cold air into the apartment, and the house is liable to continued draughts, and if the floors are damp, the occupants become positively afraid of the fresh air which ought to find its way in for the purposes of ventilation; and exert all their ingenuity to stop up every crevice that may exist, and thus expose themselves not only to colds, but rheumatism and ailments of a more dangerous character. Then, again, if the mother of a family has not a proper place in which to wash and dry the clothes, and is obliged to carry on that operation in the living-room, the living-room becomes untenable to the father and children, and they desire to get out of it as often and as soon as they can. In my opinion, that is the cause by which one of the greatest curses of our country, viz., drunkenness, is promoted and encouraged. It is the discomfort of a man's home which induces him to withdraw from it whenever he can, and resort to the public-house for comfort which he cannot get in his own house. It is by this accidental circumstance that he is led into a habit of drinking, which he would probably have abstained from, if he had had a more comfortable home. Then, again, there is nothing that more conduces to the morality of a family than having a decent dwelling-place. It is one of God's ordinances that the family relationship shall be the means of preserving the members of the family from temptation and evil, and anything calculated to make the home uncomfortable and diminish the ties of family could not be too much deprecated. It is most important that the youth of this country should be educated; but if, on returning home from school, a boy finds that the home influences do not coincide with the moral lessons he has been

taught, there is a great risk of those lessons being deprived of the greatest portion of their efficiency. If, instead of finding peace and comfort at home, he finds discomfort, annoyance, and irritation, the most evil consequences are certain to result."

There is a good deal in this that many of us may be, perhaps, too familiar with already; but it is very directly put, and we must remember, moreover, by whom the sad picture is drawn. Mr. Cowper went on to say, that he believed there was no way in which the wealthy classes could better spend their money than by improving the dwellings of the poor; and ultimately a committee was appointed for the purpose of forming a company under the Limited Liability Act, to carry out this as the object of the meeting. If the wealthy classes will spend their money in this way, of course they can do much of themselves. If, however, the movement is to be anything like general, the action of a public body, such as that suggested, will tend to make it yet more efficient. But this is by no means all. Private persons, or even public companies, are not alone those we should look to or depend upon for the thorough reformation of so national a disgrace. We must go further, and ask the attention and the aid of the Government. Fortunately we already have it. At this meeting, for establishing a Society to improve the dwellings of the poor, the Premier of England presided, while one of the Members of his Administration was the chief speaker of the occasion, and the warm advocate of the object proposed. Let, then, the country gentlemen begin to lay out their money with some heart, and the new company go to work with good will, for our rulers are with us. Lord Palmerston and Mr. Cowper are luckily something more than the mere owners of lands in Hampshire. If there is anything to be done "in another place," to whom could we go with so much confidence with our prayer that it should be done?

And there is something to be done even beyond holding meetings in the town-hall at Romsey, inciting the neighbouring squires to better things, or actually starting that great embodiment of an Englishman's energies—a public company. The inferior dwellings of the labouring classes—the immoral and unwholesome crowding of cottages—the hopeless attempts hitherto made at improvement—are all, more or less, attributable to the action of a measure that is still in full force on the statute book. Under such an influence, landed proprietors have been encouraged rather to pull down than to rebuild the homes of the rural population; and the farm-serving man that Bloomfield sung of, has been driven into the half-street, half-gutter of the next village, or the yet more noxious purlieus of the neighbouring city. Deprived alike by such a means of the sympathies and encouragement of those who employ him, he gradually declines to that most miserable of characters, the town-housed country-workman. Every little aid that might go to improve his condition is cut off, and with less means than the mechanic, his common lot is "the worst of everything." If Lord Palmerston be the practical man we take him to be, one of his first

acts, as Prime Minister of England, will be to offer some assistance to the Chairman of the Labourers' Dwellings Society, and in doing so to strike off the Law of Settlement from the Books of England. With this still to contend against, however good our intentions, the selfish and short-sighted will soon relapse into their old ways, and the working man be dug out and hunted off like some hateful vermin.

Then, again, Mr. Cooper feelingly protests against one of the curses of the country, and one that the discomfort of a man's house encourages. This is drunkenness; and sound enough so far the argument; but the Statute Book encourages such vice quite as much or more. The labouring man cannot get his drop of beer without crossing the threshold of the public-house, or by throwing his children in the way of that temptation he himself may be cautious enough to avoid. How many miserable homes—how much immorality and crime is directly traceable to that legislative wisdom which drives the working classes to the beer-shop! It is not the mere act of inciting the gentry to build better houses for the labourers that will raise the

tone and morals of the man. Let us rather at the same time see how he stands from other points of view, and what others may do for him. At this moment it is by those most able to help him that he is the most neglected: while without that assistance, all our individual efforts must be deprived of much of their effect. Every one but the Government would seem keenly alive to the question. There was the meeting at Romsey on one day. There was a far larger gathering, with precisely the same object, at Edinburgh a day or two previous. It is no longer a class topic with the agricultural journals, but newspapers of all orders and opinions have given their best support to the movement. The public mind is fairly roused, and surely the Government will be no longer asleep. The Law of Settlement, as the first step, must be repealed. The baneful action of the Malt-tax and the Beer-shop Bill must be, at least, relieved. And then Lord Palmerston and Mr. Cowper may speak alike with consistency and thorough honesty of intention, either in the Town Hall of Romsey or the Commons House of Parliament.

HEXHAM FARMERS' CLUB.

The Annual Meeting of the Hexham Farmers' Club was held at the White Hart Inn, Hexham, on Tuesday, Jan. 8: John Grey, Esq., of Dilston, in the chair.

The Secretary (Mr. J. Lee) read the committee's report for the past year, which showed the Society, after an existence of 15 years, to be in a state of the most satisfactory prosperity. The members numbered 179, and there was a balance in the hands of the treasurer of £22 5s. 6d. The library contained 200 volumes on agricultural subjects, besides a number of magazines and periodicals. A subscription had been entered into for practically testing the steam plough in the district, and £80 had already been raised towards this object. Messrs. Pattinson and Co., of Hexham, iron founders, were ready to place a steam engine at the disposal of the society, whenever the time should be fixed upon for the trial.

The Tyneside Agricultural Society held its Annual Meeting at the conclusion of the business of the Farmers' Club; and the report showed that after £103 had been expended in premiums, upwards of £43 remained in the treasurer's hands.

An Exhibition of Roots took place concurrently with the above meetings; and for mangold wurtzels Mr. John Crawford, of Beaufront, was awarded the first prize; Mr. J. Lee, of Dilston, the second. Swede turnips: Mr. Matthew Wilkinson, of Bradley, first; Mr. Robert Jewitt, Corbridge, second. Other varieties of turnips: Mr. A. Cowing, Moralee, first; Mr. Wm. Charlton, Lenuilo, second.

At the anniversary dinner of the societies, held at the White Hart, there was a numerous assemblage of the principal gentry and clergy of the district, under the presidency of John Grey, Esq.; and the Rev. Christopher Bird, of Chollerton, read a very interesting paper on the education of farmers' sons. He said that the young agriculturist ought to have a more enlarged and liberal education than that which prevails at our ordinary schools—an education built on a deeper and broader foundation, and with better materials than had hitherto been the case. Farmers did not occupy that relative social position, nor exercise that political influence, nor give to agriculture that dignity which, considering the capital they employed, the abilities they exercised, and the supreme importance of their occupation, they ought to. If it were the duty of the manufacturer to provide clothing and furniture, of the merchant to distribute them,

of the physician to take care of our health, of the lawyer to guard our property and person, of the architect to build our houses, and of the clergyman to guide our faith, all of whom are looked upon as enlightened men, it was the office of the farmer to provide wholesome food for the community; and to do this scientifically, it required that he also should be educated. If the farmer failed to perform his duty, the whole fabric of society must fall to the ground. What reason, then, could be given why the agriculturist should not feel himself upon a level with any of these professions, except that his education had been neglected? The capital embarked—the labour and care exerted—the number of hands employed, directly and indirectly, by the plough, were two-fold more than were put in motion by the loom; and yet the manufacturer and merchant exercised double the political influence which the farmer did, as the latter was often made to feel, by the distribution of taxes. He could see no other cause for this than that the sons of merchants and manufacturers and professional men had a more enlarged education, and more of that power which general knowledge gives. They felt themselves more equal to take a prominent part in political discussions, and were better qualified to gain a hearing from the public by speaking and writing. A fluent tongue, a loud voice, and a confident air would carry the day always against a silent adversary. It was a saying, "truth is mighty and will prevail;" but he had found that those opinions which were most strenuously and ably enforced generally gained the ascendancy. Education was making rapid advances amongst all classes, under the encouragement and support of Government; and great facilities were being afforded the labouring classes for the education of their children. Few in the next decennary period would be unable to read and write; and unless some strong effort was made on behalf of the rising generation in the agricultural world, they would find themselves distanced in the race, and left in the rear by a class of persons whose occupation was much humbler than their own. He then proceeded to show the kind of education they should seek to acquire, instancing particularly, after having gone through an elementary course of training, botany, geology, chemistry, and mechanics.

The discussion raised on this important topic was particularly interesting. Several toasts of a local and general character followed, the evening being spent apparently to the gratification of all present.

CONDITION OF THE RURAL LABOURERS IN SCOTLAND.

A public meeting was recently held in Queen Street Hall, Edinburgh, to take into consideration the condition of the rural labourers in Scotland. There was a pretty numerous attendance, principally composed of gentlemen engaged in agricultural pursuits.

Mr. Peter M'Lagan, of Pumpherston, Mid Calder, proposed, and Mr. Simpson, of Teawig, Invernesshire, seconded, the following resolution, which was carried:—

"That, taking into consideration the general improvement in agriculture in Scotland, it is most desirable that increased attention should be directed to improving the condition of the rural labourers."

Mr. Cowie, of the Mains of Haulkeston, proposed, and Mr. Maitland Heriot seconded, the following, which was carried:—

"That, as comfortable and commodious dwellings greatly tend to promote morality, delicacy of feeling, and sound bodily health, this meeting, while cordially admitting what has already been done in this direction, would earnestly call the attention of landed proprietors and farmers to the necessity of increased efforts to provide these in greater numbers than exist at present, and to the facilities afforded for this purpose by recent Acts of Parliament, enabling proprietors of entailed and unentailed estates to build and to improve cottages."

Mr. George Hope, Fentonbarns, moved the next resolution, which was as follows:—

"That, as improved cultivation necessarily implies an increase in the amount and quality of the labour employed, it is the duty and interest of both landlords and tenants that a sufficiency of cottage accommodation be provided on every farm, thus removing at the same time an impediment to the

formation of those domestic and family ties so essential to the happiness and welfare of the human race."

It was seconded by Mr. Scott Skirving, and carried.

Mr. Macduff, of Bonhard, proposed, and Mr. Sheriff Tait seconded the following:

"That this meeting recognises the necessity of greater attention on the part of proprietors and farmers to the importance of education, both juvenile and adult, and especially to the disadvantages connected with the practice of taking away children from school during a pressure of field-labour."

Mr. Murray, of Philiphaugh, proposed that there should be added to the resolution the following clause:

"That this meeting views with deep regret the continual announcement of the numerous illegitimate births of most of the rural districts of Scotland, and strongly urges upon proprietors, clergymen, and tenants (and farmers' clubs), the necessity of a most searching enquiry into the various causes which conduce to this frightful evil. This meeting is of opinion that the present state of the hiring markets, the general want of proper cottage accommodation for the labourers, and the improper employment that females are called upon to perform among sheep and cattle, may be reckoned among the leading causes."

The resolution was put with and without Mr. Murray's clause, and the numbers being very nearly equal, the Chairman decided in favour of the additional clause.

On the motion of Sir John Stuart Forbes, a committee was appointed to carry out the above objects. Thanks were given to the chairman, and the meeting separated.

ON THE WINTERING OF HIGHLAND CATTLE.

Turnips *ad libitum* at one time, straw at another, corn and cake at a third, and water at a fourth, whether the animal is tied in a stall, or loose in the strawyard, is a questionable practice in the wintering of the Kyloe, although one of every-day commendation. It is so for more reasons than one; for, granting that the articles specified are of the very best quality, a condition seldom or ever realized, and household accommodation satisfactory, which is rarely or ever true, the quality of such food, and the treatment that accompanies it, are diametrically opposed to the quality of food and treatment that produce those good qualities which gives to the Highland ox his characteristic superiority when placed before the artist, or when brought to the shambles, the butcher's stall, and the table, to serve the purpose for which he was reared and fattened by his owner.

The question of quality of food is inseparable from that of quality of carcass. If the superiority or inferiority of the former is admitted the superiority or inferiority of the latter must be granted, other things being equal. The fine quality of meat, peculiar muscular development, symmetry generally, and long woolly coat of the Highland ox, are not matters of chance, or even of geography, as the diversity of quality amongst the different breeding herds throughout the highlands of the mainland and isles of Scotland proves. On the other hand, the inferiority of the meat of our improved Short-

horns, Devons, Herefords, Southdowns, Leicesters, Cotswolds, &c., is to be attributed to the inferiority of the quality of the food they consume, with the improper treatment they otherwise receive. These are facts acknowledged by the every-day experience of all, who, like the writer, have bred and fed Highland cattle amongst their own hills, and our improved breeds in the low lands.

It would be highly interesting to know the chemical and medicinal properties of the herbage upon which our Highland cattle feed when grazing in their native pastures. From the large quantity of plants, from the diversity of soil, altitude, and other influencing causes that affect such properties, the question, when viewed in all its details, is a very comprehensive one, not likely to receive a practical solution for a long time to come; but, nevertheless, the medicinal properties of the different plants are generally known, and were medical botanists to investigate the subject as far as the present progress of science permits, it would tend to throw much daylight, not only upon the dietetic quality of the Summer food of our Highland stock, but also upon what we should give them during the Winter, so as to improve their breeding properties, as to early maturity and weight, without deteriorating the quality of their meat.

Into this medicinal investigation we shall not enter at present, beyond one plant which occupies a more than

ordinary prominence in the list, and that one is heath; and, we may add, that our reason for making it an exception is, because we believe many fallacious notions are associated with its use as food for cattle, both in the highlands and lowlands.

"*ERICA VULGARIS*" (common heath), says Dr. Dunglison, in his Medical Dictionary (an American work) "has been regarded as diuretic and diaphoretic"—two properties of inestimable value when associated with those of the ordinary food of our cattle. When in bloom, the period at which heath has generally been considered to possess the greatest value, it yields to bees a larger amount of fine honey than perhaps any other plant, and also by distillation a strong alcoholic spirit, at one time extensively used by our forefathers. In Sweden it is harvested like hay, and extensively used during winter in the feeding of stock, more especially sheep. About the commencement of the present century its use as a forage plant for sheep in winter was strongly advocated by almost every agricultural writer of any authority in this country; and the more the medicinal properties of the food of our Highland cattle and sheep are understood, and the influence they exercise upon the quality of their beef and mutton, the more will it grow in favour as an article for mixing with the ordinary feeding materials now given to live stock during the summer season as well as during winter, especially where animals are housed. It is one of those plants, too, that can easily be harvested and ground into meal, so as to become a marketable commodity of easy conveyance to supply the requirements and demand of every province in the kingdom. It is possible therefore, and more than probable, that this now rather despised plant may, amidst the progressive rivalry of things, become one of the most popular of our feeding stuffs.

Turning, on the other hand, to the food and management that have produced our improved Shorthorns, Herefords, Devons, Leicesters, Cotswolds, Southdowns, &c., and the inferior quality of beef and mutton into which it is manufactured, it is manifest that neither the one nor the other—neither the raw materials nor the manufactured article will bear investigation from a chemical and medicinal point of view, the inferior quality of the beef and mutton being tangible evidence in proof of the inferior chemical and medicinal properties of our oil-cakes, turnips, &c., as feeding stuffs, when coupled with a system of management diametrically opposed to the proper development of healthy organism, or, in the more current phraseology of the shambles, to the proper mixture of fat and lean. Oil-cake and turnips have, since ever they were given to cattle, been known to injure the flavour of the butcher-meat and dairy produce made from them.

It will no doubt sound very unfavourable, in the ears of some, to say a single sentence against the use of two such popular feeding stuffs as turnips and oilcake. But when we begin to investigate chemical and medicinal properties, and their influence upon the quality of the food of our cattle, and the quality of the meat made from them for our tables, the plain truth must be told. In other words, the noxious flavouring properties of

linseed and of the turnip must be dealt with as matters of fact. Now, Dr. Thomson in his London Dispensatory, Morton in his Veterinary Pharmacy, and all writers of any authority, acknowledge the fact that linseed oil contains those noxious principles to which we refer. And with regard to turnips, the pungent smell of the cattle's breath while feeding, and their carcasses when slaughtered with the belly full of them, must be accepted as tangible evidence, by all who have turned their attention practically to the subject, that they contain properties incompatible with finely-flavoured meat.

In reply to this, it may no doubt be said that the noxious principles in linseed cake and in the turnips may be neutralized before such feeding stuffs are given to cattle; but although such may be accepted in extenuation of the case of turnips when they are properly cooked, yet when we come to the practical question, the actual manner in which turnips are given, the examples are few and far between where such an extenuation can be accepted as matter of fact; the contrary being true, turnips being given in the most objectionable manner that can well be conceived. In point of fact, so long as our chops and steaks—cream and butter savour of the noxious flavouring matter of oilcake and turnips, the practice of giving such articles is open to objection.

But without going into the chemical and medicinal properties of an objectionable character, the very fact that the present food of our improved live stock produces an inferior quality of meat to that of the Highland ox in his native glen, brings us to the obvious conclusion that the food and treatment of the former are not those by which we can hope successfully to improve the latter. In other words, to maintain the fine quality of Highland beef and mutton, while we advance early maturity, it would be at variance with the established laws of physical science to have recourse to that system of feeding and general management that have produced the contrary of what we wish to maintain.

Although we are here speaking of the quality of Highland beef, it must be understood that we are discussing the proposition of wintering a Kyloe that has to be returned to his native hills on the first approach of summer. It may be necessary to remind the reader of this; lest any one accustomed to fatten off Highland bullocks for the shambles should hastily conclude that his experience stood opposed to our deductions. To do even-handed justice to the Kyloe we must commence the process of fattening when he is sucking his dam, in the same manner we do to obtain the early maturity and heavy weights of our boasted improved breeds.

At present the Kyloe is starved and stunted at the very commencement of his grazing career, or during the first autumn and winter, and every winter season afterwards, until he finds his way southwards to be fattened off for the shambles. Under such a system, we question very much if there is another breed that could endure what he does, and return an equally heavy weight of carcase, even at his somewhat advanced age when he arrives at the slaughter-house. The facts of the case speak for themselves, and they may safely be left to do so, against

all rivalry and opposition, at any stage of enquiry in the whole period of his existence.

It will thus be seen that while we endeavour to sail clear of Charybdis on the one side, we must avoid foundering upon Scylla on the other. The rock is just as dangerous as the whirlpool, and as much to be shunned. Indeed, to taint the pure blood of the Kyloe by sowing the polysarcian seeds of that most loathsome of all diseases OBESITY in his constitution, by improper food and management, reducing the quality of his carcase to a level with that of a Shorthorn, is, perhaps more objectionable than the present stinting system, with all the maladies to which it gives rise. At all events, if both objections can be avoided by a different system of feeding, one that produces early maturity, with heavy weight, and fine quality preserved, it is certainly worth enquiring after.

Following up the subject practically from the commencement, the first thing is to prevent the Kyloe calf getting "a set" immediately on its being weaned, or rather perhaps when it has to begin and shift for itself, and this can only be done by giving both it and its dam better keep than they now generally have, immediately before they are removed from the hills to their winter quarters. This part of our proposition—improved pasturage and shelter—was disposed of in a previous article. What we have to notice here is the fact that if the Kyloe calf gets "a set" before it goes into winter quarters the first season, the consequence must inevitably be not only a serious sacrifice of winter keep, but also of early maturity and weight. When, on the contrary, it gets plenty of milk and keep, to preserve it in all its pristine integrity in a manner parallel to that of its rivals—improved Shorthorns, Herefords, and Devons—at the same age; then, and then only, it is gathered from its native hills to wintering under circumstances of comparative fair-play—one of the most interesting examples of roundity of the whole bovine race.

We now come to the bone of our subject—the returning of the Kyloe to the next year's grazing in his native pastures, with all his functions and physical faculties unimpaired. If we took him from the hills sleek and round

as "a lady's muff"—a comparison not unfrequently made—and so agile as to be capable of crossing grounds with ease, where his rivals would break both their legs and necks, we must return him equally qualified for the ups and downs of Highland grazing. To blunt his instinct and relax his muscular energies would unqualify him for grazing successfully in his native pastures. We must therefore preserve his sensorial functions in all their pristine keenness and activity, which can only be done by food of a quality compatible with that of his native grazing grounds; and we must, next, preserve his muscular development and agility by suitable exercise, with pure air and the stimulating influence of light.

It is when we begin to examine the quality of his winter food, or rather what it should be, from this practical point of view, that the assistance of the medical botanists appears to be so essentially necessary to success. Those who have any experience in the management of our first-prize improved breeds must be familiar with the caution that requires to be exercised in turning out a Shorthorn from winter keep to grass—the absolute necessity of a gradual change to avoid harm, and the advantage gained by as uniform a system of dieting and general management as possible. Why should the practice be otherwise in the case of the Kyloe? In both cases certain principles of feeding and management are necessary to be attended to, in order to realize successful results; and as Highland grazing fixes those principles during the summer season, it follows as a natural consequence that to obtain success in the improvement of the Kyloe, the unalterable principles which his native hills have thus established must be carefully observed during the winter. So far as general management and heath are concerned, we see no difficulty in the Highland ox being thus supplied when at winter quarters, agreeably to the demands of his native mountain pasturage. And if we cannot supply identically the rest of the herbage consumed during the summer season as we can heath, it is nevertheless possible to supply other raw materials of food similar in principle and under circumstances calculated to improve one of our best breeds of cattle.

THE HERDS OF GREAT BRITAIN.

CHAPTER XXIII.

MESSRS. SAUNDERS' AND UNTHANK'S.

The stalwart Cumbrian form and the eternal cigar of Mr. John Unthank, of Netherscales, have become familiar to the frequenters of our cattle shows, from the Tweed to the Medway. It would be strange indeed if they were not, as none of the barons of the Shorthorn bench are in greater requisition, and none love the task more dearly. The circuit journeys of his learned Westminster brethren sink into nothing in comparison, as, last year alone, he judged at fourteen shows, including the Royal Canterbury, and travelled upwards of 3,000 miles, both by land and sea. Since he first gave

up his Galloway herd, some five-and-twenty years ago, in favour of Venus by Crofton's Cripple (1887), he has been by no means exclusively devoted to "the Durhams." Blood, coach, and cart stallions have had their turn, and worn the prize ribbons for him; and his greyhound Van Tromp won a match and two cups in succession at Bendrigg. Messrs. Brown and Watson, the celebrated Cumberland pig breeders, also derived most of their best winning blood from a cross between his Wiley sow and Mr. Sober Watkin's "Thormanby," which won in the large as well as the small classes at

The Royal, in the days when "they were not so particular." His two best sows, however, died at the same time as his two bulls North Star and Duke of Cambridge, just before the Carlisle Royal, and he tired of pig breeding from that time.

Netherscales, which is the property of Mr. Unthank, and farmed by him, along with a farm which he bought at Hutton End, lies about six miles from Penrith and about four miles from the Plumpton station on the Lancaster and Carlisle line. We had made no appointment, and the remembrance of that walk make us shiver yet. If we had kept-up to the tenor of the vows we then mentally registered in all apparent sincerity, *The Mark Lane Express* and horned stock might have looked-out for another chronicler. There were no hovels about, no houses; and as fast as we got under one tree, it became wet through before we could look out for another with rather more impervious foliage. Eventually we stumbled upon a woodman's chimney-corner, and were refreshed during the rough-drying process with anecdotes of the man, who had been hung at Carlisle three days before, and who had, it seems, made his first essay in cruelty, by killing a tiresome tup-lamb with his bill-hook. However, we reached Netherscales with all its Capt. Shaftoe and Old Cherry memories, under a gleam of sunshine at last, and occupied the two hours between that and the next lucid interval in the weather by gathering notes of their history. Still, famous as this pair have been in Ring and Herd-book memory, they have left no mark on the present Netherscales' herd, and have proved in the long run far less valuable to Mr. Unthank than Venus, whose tribe, after several sales at 100 gs. and upwards, has by no means died-out. Mr. Unthank bought her when a heifer, along with Lively, at the sale of Mr. Bustin, of Dolphonby, near Eden Hall, who owed much of his shorthorn success to his early friendship with Messrs. Collins and Mason. Lively placed little to the credit side; but Venus produced seven calves, two by Gainford (2044), to begin with, and two as her *finale* by Chorister, who was bought by Mr. Sober Watkin for 90 gs., at Mr. Anthony Maynard's sale, and let by him to Mr. Troutbeck. Prince of Wales by Chorister was the old cow's best hit, and his yearling victory at the Hexham and the Royal Irish meeting at Belfast, procured him a new owner at 200 gs. in the Marquis of Exeter. His Irish travelling companion was Mr. Hill's Eden by Gainford. They went together in a waggon from Carlisle to Port Carlisle, and had been safely landed back again in Cumberland when a message was received to the effect that certain entries were informal, and that the aged-bull class must be judged over again. Mr. Hill did not care for a second sea-risk, and Recruit took the prize.

Old Cherry came on to the scene about the beginning of 1843. She had been "as blooming and soft and fair" a calf as Col. Cradock ever welcomed at Hartforth, in the summer of '28; but nature seemed to have exhausted itself with so many calves, and she was tied-up to feed. For years she had been a sort of heroine in Mr. Unthank's mind, although he had never seen her; and when, by the merest chance, he heard of her

doom, he set-out at once for Yorkshire, in quite a spirit of knight-errantry, and bought her, with her fifteen years on her head, for nearly twice as many pounds. He had rather a weary time of it, getting her across the Westmoreland moors, and the venture did not look very hopeful when she broke to His Royal Highness, who then reigned at Lowther. Wonders never cease, and her Sir Francis calf of the next May, worthless as he proved, earned that name right well. Captain Shaftoe had arrived at Netherscales the same year, and the cherished object appeared at last on September 4th, 1845, in the shape of his daughter Queen of Trumps. The old cow was so weak after calving, that when Mr. Unthank left her, to fetch a drink, she fell sideways on to her calf, and nothing but the greatest care, and incessant inflation through the nostrils with the kitchen bellows, brought it round at all. In process of time it grew into rather a nice little cow, and bred Second Queen of Trumps to Belleville, in the days of his twenty-five-guinea renown. Old Cherry was never in season again, and she became so crippled that Penrith had the eating of her in 1847 and the nineteenth year of her age. Second Queen of Trumps was then chopped away to Mr. Douglas, of Athelstaneford, for Baroness Amelia, Queen Athelstane, and another; and her cross with Captain Balco produced Third Queen of Trumps, who swept the three royal national two-year-old heifer prizes on "the grand tour" of '58, and died within sight of New Orleans that winter, with 450gs. on her head. Such were the Netherscale variations upon the popular "Cherry Ripe."

Captain Shaftoe's history was a less chequered one. Mr. Unthank had become deeply smitten at Richmond with his short legs, rich quality, and gay looks, when he was the first prize yearling of the Yorkshire Agricultural against Belleville, Cramer, and Belted Will; but he had no little difficulty in persuading Mr. Lax to part with him for £200. The late Mr. Benn, always enthusiastic in the shorthorn cause, lent the Lowther van, and as Mr. Unthank sold "The Captain" after a couple of seasons for a £100 advance, to Mr. Loft, of Lincolnshire, his second Richmond thoughts proved as good as his first. Mr. Parkinson, of Leyfields, gave the last bid of 325 gs. for him at the Trusthorpe sale, and won in the aged class with him at the Northampton Royal, the same year that his half-brother, Baron Ravensworth (7811), gained that honour among the yearling bulls. After coming second to Mr. Bates's First Duke of Oxford, at the Yorkshire Show of that year, he changed hands a fourth time, for 140 gs., to Mr. Smith, of West Razen, who kept him for five years, and then sold him to his brother, in whose hands he died. He had a great propensity to fatten, and got his cows very good and compact, but rather too small. Skelton was the best of his Netherscale bull descendants, and he in his turn begot California. Among other purchases of choice blood were Daphne Gwynne, from Mr. J. P. Senhouse; Hartforth by The Provost and Sweetbriar, from Colonel Cradock; and Ormolu (not in calf), for 55 gs., from Mr. Spearman, while on the *per contra* side we find Valiant and Gavazzi sold to Colonel Towneley, Em-

peror Napoleon to Sir Charles Tempest for 150 gs., and Blue Bell (£115) to Mr. Douglas.

Of latter years Mr. Unthank has imbibed the popular leaning towards the Booth blood, and began by buying old Benedict from Mr. Dickenson, of Ulverstone. He kept him for two seasons, but to no great purpose, as several of the cows cast calf to him, but a clever short-legged yearling heifer, *Jessie Brown*, with fore-quarters bearing all the stamp of her race, *Lady Like Gwynne*, and *Venus* remain to attest his stay. Mr. Unthank swapped him in his thirteenth year with Mr. Torr, for Freemason, by Vanguard, who was sold after a season's use (of which twin bulls from Ormolu were one result), to Mr. Reed, of Cupar Fife, and won the head prize at the Cupar Show this summer. *Prince Imperial*, by Solon by Abraham Parker, from a Skelton cow, and full of Captain Shaftoe blood on both sides, now divides the sway with *Master Hopewell*, though, of course, the latter, from his superior blood, gets the great majority of the cows. The former was first led out for us, and with the exception of a slight patchiness on the top of his tail, and horns which come nicely enough out of his head, but do not perhaps "open" sufficiently, to our taste, afterwards, he is every inch a show bull, and on a remarkably neat leg. He went amies while he was being prepared as a two-year-old, for the Highland Society's Show, in 1859; but he came out at Coldstream this summer, and beat Mr. Tod's elegant, but sadly unfruitful Statesman and a large field. *Master Hopewell*, by Hopewell (10332), from Mr. Barnes's Modish, by Baron Warlaby, is a pure Booth importation from Ireland, and now that Knight of Warlaby has left Captain Spencer's, he is the only one in Cumberland. He is nothing very much to look at, as he is kept very poor for use, but handles right well, and has hair of the most peculiar silky texture. His calves were just beginning to come about the period of our visit, and *Familial Hopewell*, with a nice top and deep middle, occupied the scene of the bellows drama. *Ormolu Hopewell*, whose faint roan colour exactly brought back old Modish, and our very piercing Saturday and Sunday in Meath, was sucking a longhorn at the end of a byre; and *Hopewell Gwynne* was alike busy with a strange compound of a Shorthorn and a Galloway.

The Gwynne tribe have flourished apace since *Daphne Gwynne* arrived back from the West Country, into Mr. Troutbeck's neighbourhood once more. Daphne herself looks very gay for her years, and boasts of a wonderful bag, which can furnish 30 quarts a day at times, and good enough in colour and taste to make a Devonshire man envious. *Lady Like Gwynne*, by Benedict, and *Gaudy Gwynne*, by Sir Charles, are her two daughters. The former has been sadly knocked about by having a calf before she was two years old, and Gaudy, who keeps all the fresh and healthy Gwynne character, derives her appellation from her heritage of the Sir Charles colour. *Alice Gwynne* was a nice-coloured short-legged calf from Lady Like Gwynne; but *Sir Henry Havelock*, from Daphne Gwynne, had only just got over the troubles of a broken thigh. A cross between Prince Imperial and Gaudy Gwynne had also suited pretty well in a bull-

calf, which roamed the Front Garth with *Primus* and *Secundus*. The patchiness of age had told upon *Baroness Emilia*, by Baron Ravensworth (7811), who was bred by Mr. Stewart. Her daughter Emily was sold to Colonel Towneley, and from her sprang the beautiful Emma. She has great substance, and grand hind quarters, and is the last that her owner has shown either in Cumberland or Westmoreland. On one occasion Mr. Unthank all but "skinned the lamb," when the "Cumberland and Westmoreland" met at Appleby, by taking nine animals, and getting eight firsts and one second; and the defeat of the prize heifer of this Society, and the Carlisle prize heifer of the year as well, by Baroness Amelia, at Penrith, was his last achievement in the ring.

The Portia tribe, which goes back to Eden, son of Gainford and Venus, still flourishes in *Portia 4th* (the dam of Emperor Napoleon), her daughter *Portia 5th*, by Gavazzi, and her grand-daughter *Venus*, for which Mr. Atherton recently bid 100 gs. in vain. *Lady Havelock*, from Playful, a neat little cow, by Inkermann, also looked worth training; and among the cows, *Bridesmaid 3rd*, from Carr's Bridesmaid 2nd, and *Miss Frances*, a lengthy, true style of animal, with a nice snug fore-quarter, but not so neat as the white little *Familial*, though both of Booth descent, claimed a note with *Miss Nightingale*, of Earl Spencer lineage. Among the females, we also put a mark against *Jessie*, from Prince Imperial's dam, and *Lady*, of the Bates blood, with good substance and quality, but hardly the neatness of some of the others. The promising white *Osborne*, with a coat as long as an alpaca, was also there, among seven or eight yearling bulls and bull-calves, to wit, *Prince Leopold* and his brother *Giribaldi*, from Portia 5th, *Inglewood*, from Miss Frances, *Prince of Prussia*, from Rose of Spring, and *Grand Master*, from Baroness Emilia. The last five, with the exception of the Prince of Prussia, were all by Freemason, and for sale. We had, however, no time to cwell, as two days had to be rolled into one; and Nunwick Hall to be reached, with a working-hour in hand.

A damp seven-miles ride past Plumpton—to which the late "Bob Gordon" returned so often from the Carlisle wrestling-ring with the Champion's belt round his loins—and on through a fir-and-heather-clad country, brought us at last to the pleasant vale of the Eden. The afternoon shadows were chasing each other on the Crossfell range behind; and our companion, who was cunning in cloud-language, foretold that the helm-wind—of which we had heard the Rev. Mr. Watson of Cumrew discourse so well, three-and-twenty years ago, before the assembled *savans* at Newcastle—would be out for his wild revels among shed-roof and haystacks before nightfall. Nunwick Hall, with its old manorial grange, and its knoll of oak, ash, and sycamore, which crowns the home-meadow, looks the Shorthorn-home to the very life; and the stone bulls rampant on the gate-pillars keep fitting watch and ward. It is just two-and-twenty years since Mr. Saunders became smitten with "Hoof and Horn," and repaired to the sales at Lowther, where he purchased a son of Gainford, whose fame

was well established as the "Comet" of Cumberland. This bull, however, did him but little good, in comparison with his successor, Mr. William Smith of West Rasen's *Homer* (2134), of Lord Spencer's breeding; and never were 70 gs. better laid out. He was nearly seven years old when he came; and after three seasons' use, the present Duke of Devonshire purchased him, at the first Nunwick sale. *White Rose*, by *Gunthorpe* (2049), had been among the first females which Mr. Saunders selected; and from a cross between the former and *Homer*, and Mr. Sober Watkin's *Chorister*, the kernel of the first herd was derived. Mr. William Parker was equally alive to *Homer's* merits; and the cross with his *Windermere*, of Mr. Sober Watkin's Old Emperor blood, brought out that Pearl tribe which Mr. Saunders went boldly in for at the Yanwath sale. A few *White Roses* were left, as relics of Mr. Saunders's first era; and *Abraham Parker* (9856), by *Mehemet Ali*, shortly arrived from Broughton Hall, to play hero in the second. In his owner's mind he has always ranked below *Homer*; but he reigned a year longer on the Eden-side. His quality and top were quite good enough to counterbalance rather faulty thighs and flanks; and his best nicks were with *Venus*, by *Bellerophon* (3119), from one of Sir Charles Tempest's cows, and *Fanchette*, by *Petrarch* (7329), from one of Mr. Watson's. *Venus* calved Sir Charles (12075), and *Sherry*, now in Sir Matthew White Ridley's herd; and *Filagree*, from *Fanchette*, became Mr. Alexander's for 150 gs., at the Nunwick sale of '55. *Venus* had been subjected to the iron hammer some weeks before the knock-me-down of the ivory one was heard in the land; and the 56 which remained averaged about 40 gs. The fact of its being the week before the Carlisle Royal brought a very goodly assemblage to Mr. Strafford's aid; *Fanchette*, whom Mr. Sanday bought for 31 gs., as a speculative bargain proved a very great hit; and Mr. Drewry was pretty lucky with the pair of doubtfuls—*Sarah Gwynne* and *Cicely*—which he added to the Holker herd. Mr. Cartwright, of Aynhoe, and Mr. Howard, of Bedford, had a fancy for *Pearls*, and acted on it; and a heifer-calf of this tribe was the only keepsake at Nunwick when

"The last wheel echoed away."

Mr. Saunders did not leave her long to pine, in his 309 paternal acres, among half-breds; and his journey to the *Fawsley* sale, in the April of the next year, resulted in the purchase of *Fleda*, by *Greyfriar* (9172), and *Lady's Slipper*, by *Earl of Dublin* (10178), for 155 gs. each, after a punishing finish with the Americans for the latter. Sir Wilfred Lawson, of Brayton Hall, in the same county, bought three, the highest of them for 125 gs.; but his luck with them has not been equal to his neighbour's. The amazing fertility of the *Fawsley* herd has been as singularly proved by this pair as it has been by *Garland* and *Chrysalis*, seeing that each pair have had ten calves between them. *Fleda* was heavy in-calf with *Baron Fawsley* (14130), by *Duke of Cambridge* (12742), when she came; and the cross with *Prince of Glo'ster* (13517), who was bought from the Duke of Devonshire's the same spring, produced *Nunwick*, the

twins *Ella* and *Minnie* (which were on a visit to *Holker*), and last, though not least, *Annie*. A hundred guineas was refused for *Prince of Glo'ster*; and the butcher's report of him recently was, "30 stone a quarter, sinking offal." The herd of cattle on the farm generally averages about sixty head, of which twenty are pure *Shorthorns*, and the rest have one or two crosses. The thorough-breds are gradually creeping into a majority; and *Birthday*, by *General Have-lock* (14598), from *Siddons*, and *Nelly Gwynne*, by *Old Rowley* (15020), from *Orphan Gwynne*, are accessions since our visit.

After a little rough-drying, for the second time that day, we merged the past in the present, and sallied forth into the court-yard. Mr. Adkins had been there a few days before us, in search of his cherished *Favourite* blood, and carried off *Mocassin*, by *Nunwick*, from *Lady's Slipper*, as the corner-stone of a new herd. *Mocassin's* own brother was there, bearing the old *Duke of Glo'ster* coat, mark for mark, as well as other characteristics. Drawn up side by side in the yard behind, were the old bulls *Baron Fawsley* and *Nunwick*. The former, who has since become beef, failed by comparison as regards style and fine bone, and his good spring of the rib was rather counterbalanced by his sire's fault behind his shoulders, which was more apparent when he was set in motion. Although he measures well through the heart, *Nunwick's* middle was hardly equal to his rare ends, and the best view of him is from behind, as his twist is so well let down. He beat Mr. Watson's *General Haynau* at *Penrith*, in 1859, after a long discussion between Messrs. *Douglas* and *Culshaw*, the judges, but this year *Captain Spencer's Young Ben* was too much for him. Mr. Saunders has had some good calves by him, nearly all roans like himself, but *Eighth Duke of Oxford* (15939) has been hired from the Duke of Devonshire for the ensuing season, for the sake of a pure *Bates* cross.

The next move was made to the byre, which has just been completed on the most perfect scale, with perforated windows and capacious skylights. There is accommodation for forty cows, standing head to head, in rows of ten each, and calf-boxes are ranged along each end. *Old Fleda* ranked first in the array, and even ten years and nine contributions to the *Herd-book* have left her in capital case, and that robust style and good back and quarters are all there, which earned her so much notice on the *Fawsley* day. *Lady's Slipper* stood next her, but we had to take her more on trust, as she had not recovered from a severe attack of milk-fever, which naturally went pretty hard with a cow of her deep pail propensities. The well-packed quarters of a big red cow next her, betokened the mighty "*Gainford* his mark" in the third generation, and further on, a cross of Sir *Harry Gwynne* on a half-bred cow had told its unerring tale. Countess *Emma* by *Heir at Law* (13005) had just arrived in exchange for a 71 guinea cheque, from Mr. Stewart's sale: where eleven cows and heifers were purchased for the *Brayton* herd. She strains back to Mr. Crofton's *Elvira*, who beat twenty-one cows at

Durham in her day, and seemed a nice roan-coloured little cow, with a very well sprung rib, but not just what we liked, behind the shoulders. She was half gone again to McTurk, and her *Young Emma* was by her side in the shape of a thrifty and well-made calf, with a light milking neck. Fleda's last calf *Freebooter* by Freemason is a dark roan, and "clever," as "The Nestor of Shorthorns" would observe; and the Waterloo tribe could boast of its No. 18th and 31st, dam and daughter, from Mr. Bolden's sale. The latter of them is by Third Grand Duke (16182). *Annie* a robust and bonny yearling from Fleda came struggling across the meadow in the herdsman's grip; and the white bull-calf *Prince Patrick* by Nunwick had prophesied favourably of his dam, *Pearl 7th* by Sir Charles from

Pearl by Homer, who was in waiting for us at the meadow gate, and stood up right well for the honours of her tribe. The halter did not suit her at all, and when that had been removed, she settled herself into an attitude, which for picturesque motionless beauty we have seldom, if ever, seen exceeded in our Shorthorn pilgrimage. With the exception of being, perhaps, a trifle lightish in the thighs, we had nothing to urge against her: her bone is beautiful, and worthy of her top, and the rather Roman-nosed *Venus* head has a neck-vein and bosom beneath it of no ordinary stamp. It is right to keep a pleasant image in your eye, and the white pearl of Cumberland might well haunt us when we took train at Plumpton, for Lancashire, once more.

H. H. D.

LONDON, OR CENTRAL FARMERS' CLUB.

THE CONDITION OF THE LABOURER.

The ordinary monthly meeting of the members for discussion was held on Monday, December 10, at the Club House, Blackfriars. Mr. L. A. Coussmaker, of Westwood, presided, and there was a very full attendance of members. Amongst these were Messrs. Spencer Skelton, C. Stokes, W. Fisher Hobbs, John Thomas, James Howard, W. Bennett, J. Cressingham, J. B. Spearing, G. Dobito, G. Smythies, T. Congreve, B. E. Ward, R. Bond, J. Bradshaw, J. Carter, J. W. Paul, T. E. Pawlett, James Wood, Charles Howard, J. G. King, E. Little, T. F. Wilson, W. Walton, E. Tattersall, S. Sidney, G. Hilton, G. Boddington, E. B. Acton, E. Edmonds, J. Dunbrell, J. Coleman, W. Butcher, E. Purser, J. C. Morton, H. Middleton, J. Thompson, Robert Smith, J. F. Baines, G. P. Tuxford, W. Cother, J. Goodwin, N. Rix, John Fowler, E. B. Waite, W. C. Spooner, T. B. Browne, J. Hooker, J. Sanderson, and J. Odams.

The subject appointed for consideration was "The Condition of the Labourer in England and Scotland, and his State on the Continent," to be introduced by Mr. R. Scott Burn, of Stockport, Cheshire.

The CHAIRMAN said the improvement of the agricultural labourer—of his dwelling, his education, and his position generally—had more than once formed the topic of discussion in that room. Of the state of the labourer abroad they knew nothing as a club; but the gentleman who would introduce the subject had had many opportunities of making himself acquainted with it, and would no doubt give them interesting information on that, as well as on the other branches of the question.

Mr. BURN then proceeded as follows:

Mr. Chairman and Gentlemen, when I was honoured by your committee asking me to read a paper on the subject named, for this evening, on the card of the Club, I undertook its preparation with considerable hesitancy and fear. For I felt very acutely, that the importance of the subject demanded its treatment by a better authority than myself, and a more graphic pen than I wield, to do justice to its many requirements. In order to obtain the advantages of a systematic arrangement of subject—for the time allowed me is all too brief to do full justice to one only of its many departments—I propose, with your permission, to glance

at the various phases of a peasant's life, in somewhat like the following order:—Commencing with the earliest stages of his existence, we shall examine the condition of the house in which first he sees the light, whether in its construction and interior economy it is calculated to aid in the development of a high class of physical health and strength, of habits of cleanliness and decency, and of a sound morality. Tracing the career of our supposed labourer we shall see him fitted to be sent to school, and shall have an opportunity to examine the condition in which he can receive his education, and how far that education is calculated to aid him in the every-day work he will be called upon to perform. Educated or not educated, his next step in life is to obtain employment; and tracing him so far, we shall be led to inquire into the mode by which he can offer his services to, and in which they will be accepted by a farmer, thus opening up the discussion of statute fairs and hiring markets; and this again will naturally lead us to inquire as to the wages which his labour will bring him. Having seen our labourer educated for his work, and how that work is rewarded, I shall glance at the extent of the time allotted to him for rest and recreation, and what is the nature of the recreation of which he can avail himself; finally inquiring what is likely to be his position in advanced years, and what provision he is capable of making for that time in the life of every man, when, however much willingness to work exists, capability to do it fails. The task I have chalked out for myself is, you will perceive, no common one, nor is it free from difficulties which might well alarm me. In making my remarks I hope to do so with freedom from presumption and over-confidence. I fear it is impossible for me to get rid altogether of prejudices which result from a long-continued examination of the subject; but these prejudices I shall protrude upon your notice as seldom as may be, and if I have a hobby, as I believe I have, I shall not perpetually or over-much parade its paces before you. I wish "nothing to extenuate or set down aught in malice," but I know that I must of necessity express opinions which will run counter to those of many who hear me—"many men, many minds;" for it is a remarkable feature connected with the subject of my paper, that while there is a singular unanimity as

regards the fact that evils great in number and appalling in results are connected with the condition of our agricultural labourers, there is just as singular a diversity of opinion as to how and in what manner these evils can best and quickest be remedied. But while mindful of the deference due to the opinions of others, I shall not fail, where occasion serves, to give my own with all plainness of speech. I may speak warmly where I conceive warmth to be necessary; remembering that there are occasions where, to quote the sentence of the old dramatist, "not to be warm is to be frozen." There are many evils of a grave character connected with the condition of our labourer, which cannot be too plainly exposed; and the evil done in perpetuating those—whether this be the work of the master and man singly or both combined—too pungently denounced. I am no advocate for using fine names to designate foul deeds or bad proceedings; for I do most assuredly feel, that much greater horror of evil would result, and a more earnest endeavour would arise to get rid of it, if we accustomed ourselves to talk of it, think of it, and look at it in all its native hideousness, rather than to dress it up with outward decencies of name and looks, which do not in any way or by any means belong to it. While I shall try to deduce some practical points bearing upon the question, as to how best the evils are to be remedied which we all so heartily deplore, I shall endeavour to bear in mind that there is no universal panacea for these evils—no one cure for the disease. As the evils have arisen from a complexity of causes, this complexity must be well considered before the cure can be discovered. Good cottages, for instance, with decent accommodation, will not alone obviate the evils; for vice can be, and is perpetrated in the palace as well as in the hovel, and disease and death reap their harvest of pain and woe as well from the one as from the other. Education—the three R's—"reading, writing, and arithmetic," as they have been called—will not alone raise the position of the labourer; for we know well that along with the finest condition of the intellect, a depraved heart, and a vicious life, are too often united. High wages and cheap food will not do all that is required; for along with them we often find a reckless expenditure of the one, and a wanton waste of the other. From the persistency with which one section of this reform, which we thus see to be so many-sided in its character, has been paraded by some, as the thing which once carried out is to set all to rights, I believe much harm has arisen, and the improvement of the social condition of our agricultural labourers greatly retarded. Some take a fancy for a hobby, and think they have only to mount it, and push it well on, when it will lead to the desired end. The tyrant Procrustes, of whom we read in classic story, had a bed to which all visitors were compelled to be adjusted in their length, the operation in those who were too short being effected by their being drawn out, and on those too long by their having their feet cut off. So in like manner do we find several who have theories to which every thing must be adjusted, the operation being as unpleasant in its results and futile for good as in the case of the unfortunate visitors of old Procrustes. I confess to having in by-gone days sinned somewhat—possibly I should say considerably—in this way, but more extended observations and larger experiences have shown me that there are an infinitely greater number of causes at work, modifying and inducing the peculiar condition of our agricultural labourers, than I at one time thought of. Again, some

discuss the subject from a purely philanthropic point of view; forgetful of the fact that there are circumstances which materially modify the operation of laws, or which affect considerably the high standard which they may set up. On the other hand, some take a purely practical view of the subject, referring all the points to the decision of expediency, or asking themselves perpetually, will it pay to do this, or to undo that? In this, as in other matters, the middle course is perhaps the safest one to follow, and likely to lead more rapidly to the end. For the philanthropist is not entitled to ignore the peculiar circumstances of the position in which the farmer may be placed, which may absolutely put it out of his power for the time being to obey the high behests of a rigid right; just as much as the practical man is not entitled to sneer at what he may call the high-flown notions of the philanthropist, or to forget that in so far as they are founded upon the principles of "right," "justice," and "mercy," so must they be the standard to which all should aim at arriving, and by which all matters must ultimately be decided. I have said that the middle course is perhaps the safest; it may be the most difficult to discover—doubtless it is—but because we do not see our way to it at present, this is no reason for asserting that it does not exist: not seeing may prove perhaps our blindness or deficiency of eye-sight, not the non-existence of the object talked about. Still further, we often find the subject discussed, as if all the evils connected with the condition of the agricultural labourer were dependent on, or caused by the classes above him—as his employer or the landowner—and as if the work of amelioration could alone be carried on by these. This may appear to be the truth of the case by men who make an outside or far-off examination of the subject only; but that it is not the truth, nay, that it is indeed anything but that, those who are acquainted with the peculiarities of peasant life know full well. There are indeed some things which the labourer cannot do for himself; but I insist that there are many things which he, and he alone, can do. And it is just because I have seen, during the course of a pretty extended experience of working-men, so comparatively little real desire to raise themselves in the social scale—such a jealousy, petty and narrow-minded in the extreme, of those who attempt to show them the value of such a rise in life, and the necessity that exists that they should exercise the virtues of self-denial and self-control, in order to secure it—that I have lost much of the enthusiasm with which I at one time viewed the question, and that I now have daily more and more sternly fixed upon me the conviction that the reform of the social condition of the labourer will be a much slower process than we all wish for, if the work in connection with it is to be done only by one class, the farmer or the landowner, unaided by the labourer himself; and I conceive he is the truest friend of the labourer, as well as the kindest, who, while not failing to denounce the sins and shortcomings of the master, is no less decided in denouncing those of the servant. We hear much of the lack of sympathy between master and man, and I deplore it as heartily as any one, looking upon it as antagonistic at once to the benevolence which we admire, and the dictates of Christianity we profess to believe; but I protest against the view which is too often now taken, that the out-flowing of sympathy from the master to the man, is what is only wanted—ignoring the truth, that there is as often a failure of the stream of sympathy in the contrary direction, from the man to the master. I am sure that those who practically know the labourer, know that often the motives of

the master are miserably misconstrued, and that schemes which have the labourer's good mainly in view, are looked upon too often by him with jealousy or indifference. The work to be done in carrying out this most important of social reforms, must be mutually done. And sure am I that, no matter how much is done by the master, if the servant does not aid by the cultivation of habits of self-control, no real or lasting progress will be made. The movement will be but spasmodic after all, and have no real life-giving sustaining powers in it. Having offered these preliminary remarks, not altogether unsuggestive as I hope, I shall now proceed to take up *seriatim* the subjects named in the arrangement proposed. The first of these claiming our attention is that of "*The Cottages or Dwelling-houses of the Agricultural Labourer.*" While fully admitting the urgencies of the claims of other departments of the subject, it is impossible to over-rate the importance of this to which I am now to draw your attention. It stands second to none; nay, a full investigation of the subject in its entirety, makes it clear that good house accommodation must precede all other movements calculated to raise the position of the agricultural labourer in the social scale. "As the houses, so the men," says an authority upon sanitary matters: and there is much truth in it. The development of men in a moral as well as a physical sense, is undoubtedly greatly dependent upon the condition in which he is housed. No more can physical health be secured to the man lodged in a hovel, the arrangement and construction of which is so well calculated to create discomfort and to cause disease, than to the animal who is put up in a filthy ill-ventilated stable. And if it is worth the labour involved in the better housing of our farm stock, it is surely worth the labour to house well the workmen who look after them—worth in a double sense; for the labourer has a higher organization, which requires to be nurtured, and this cannot be done where everything surrounding the man is calculated to disgust and to degrade. By simply taking care of out-door education, if indeed we do that, and ignoring altogether that of the hearth and home—for the child's most effective training, whether that be good or bad, is the work of the home—no satisfactory intellectual and moral elevation can result. In a Christian land it is imperative that our labourers should have a house fitted to be a Christian's home. It is pitiable to have to say, in this nineteenth century highly-boasted-of time of ours, that a vast deal has yet to be done before this can be realized. It is from considerations such as these that the question of improved cottage accommodation for rural districts is considered an all-important one—important in the sense that it is essential to get healthy labourers capable of doing able work, as well as in the higher sense, that it is essential both for their and our sakes that they be morally and intellectually strong as well. I have received a number of communications from various parts of the country, on the subject of cottage accommodation, and the testimony from all is nearly complete, that as a general rule it is in anything but an advanced condition. I here give extracts from a few of these, which will help to convey some notion of the condition of the house accommodation for labourers, in Scotland and England. In *Shetland*—for I shall commence with the extremest north—"the house accommodation consists generally of a but and a ben" (two rooms *en suite*, the "but" answering to the kitchen, or living-room, in the cottages of England; the "ben" to the best, or bedroom), "with sometimes an attic, built of limestone; earthen floors,

thatched roof, and fire in centre of kitchen or *but* end, but chimney in better or *ben* end. Very little furniture, seldom a table, in kitchen; but uniformly a settle, or wooden sofa, on which a man might stretch himself; one or two wooden arm-chairs and semi-stools; a number of sea-chests, arranged as a platform; around the walls a pot or two, a tea-kettle; and the tea-pot almost uniformly and constantly at the fire. *Ben* end, table, chairs, &c., all wooden; beds with drawing lids, bound. Beds in kitchen often one above the other, like ships' berths. Bedclothes good. A handsomely-wrought, heavy bed-cover, in fancy wools, is the requisite providing of a female at marriage. In my district, the United parish, the dwellings are improving fast, and chimneys and floored *ben* ends are put into most of the newly-erected houses." The exterior of such houses is, as I can state from my own experience, anything but inviting. The walls are rough, the windows small, the roof of thatch being held down (for winds blow fiercely in that wild part of her Majesty's dominions), by straw ropes, with dangling ends, weighted by heavy stones. Interior cleanliness is not much thought of apparently; for I have seen the hens perching on the edge of the berth-beds, and the pig lying by the hearth; indeed, a general griminess pervades everything, from the want of a chimney, the smoke rarely leaving the vent, or aperture, in the roof, without curling in the interior of the house. Upon the whole, however, the house accommodation of the poor Shetlander compares pretty favourably with that of some of our southern and more favoured districts. Of the cottages in the remote districts of the *Highlands*, as in the neighbourhood of Glencoe, a correspondent furnishes the following description: "The humblest style of cottages, or rather huts, are constructed of a rough framework of timber, with heather or gorse interwoven, about two or three feet in thickness. The walls, if they may be so called, are not generally higher than about six feet; the roof thatched, with poles laid cross-wise, and bound, to prevent its being torn up by the wind. In addition to this, ropes constructed of twigs are suspended, and attached to large stones, to give additional security; but the wind is so strong that, in exposed situations, such as the moor at Corpach, my friend has seen the cottagers holding on by the ropes themselves. I believe, for these places, with a little croft attached, the rent is merely nominal. These cottages are built of stone; in some cases, of slate, as in the neighbourhood of Ballachulish. These are laid sometimes in regular fashion. Others are of rough stones of all shapes, something like a stone wall laid without mortar, and afterwards plastered in a rough way; others of river or rounded stones. The height of wall is not more than six feet; thatched roof; chimney constructed of a light framework of sticks, with turf laid against it. There are never more than two rooms, no ceiling, very often no fire-grate; but when there is, it is of the rudest description. The floors are generally bare earth, with perhaps a hearthstone or so. These have generally a little croft, in which they grow potatoes, oats, &c. For these they pay about £4 a year. Some of these cottages are anything but water-tight: I have seen some of them, during heavy rain, almost flooded, owing to the thatch having been neglected." As regards house accommodation in *Aberdeenshire*, a valued correspondent writes me: "House accommodation, in this county, is both far too limited in quantity and bad in quality. . . . It is the bounden duty of all proprietors to furnish a full equipment of substantial

cottages, combining the requisites for comfort and decency, on all farms. Withheld, they stop the onward progress of social order, and hold out a premium to vice and degradation." In *Perthshire*, another correspondent informs me, "the house accommodation is gradually improving. Still, there is much improvement everywhere required, as many are still compelled to live in wretched hovels. Unfortunately, when long neglect and inattention have allowed the cottages of a county to fall into decay, it often happens that the extreme the other way is run into, when new houses are built; and many instances, of late years, have sprung up, where the accommodation given is far beyond the wants or requirements of the class." In *Inverness*, a correspondent informs us that the "house accommodation is still deficient, in many cases consisting of one or two rooms only, for a married man and his family. But almost all new cottages now built contain three or four rooms, thus giving the requisite number of rooms for a proper division of the family." Another correspondent in *Inverness-shire* writes me as follows: "The houses of farm-servants are not generally very good. Great improvement has taken place of late years in this department, and is still going on. Wherever new buildings are erected, attention is given to this; and I have little doubt that, by-and-by, servants will, on the whole, be comfortably provided for. . . . Cottages for married men consist generally of a room and one or two small closets (bedrooms), with a wooden floor, and neatly plastered. No doubt there are still a good many old houses very inferior indeed in the district; but a great change is going on; and soon, I trust, it will be comfortably housed." In *Forfarshire*, "house accommodation," as a correspondent informs me, "is generally indifferent, and very insufficient for the requirements of the country. A family is generally huddled into two apartments, often to the injury of health, and repugnant to modesty. Every intelligent farmer, and many proprietors, are now alive to the necessity of providing better cottage accommodation. Much has been done of late years, but little as to what is required." In *Dingwall*, "the house accommodation for servants is, in some instances, very bad; in others, needlessly good. The subject is now exciting a good deal of interest, and a great improvement has been effected within the last few years." In *Dumfriesshire*—"Of nearly the whole, although now tolerably comfortable in fitting-up, certainly too limited. On an average two apartments only." As regards the house-accommodation in the *Lothians*, a distinguished agriculturist of that high-class-farmed district, writes me as follows: "Within the last few years a great many new cottages have been built, containing ample accommodation for a family; but a large proportion still exist quite unfit for that purpose. However, landlords and farmers are now alive to the fact that unless better accommodation is speedily provided they cannot hope to retain the best servants." In *Berwickshire*, "formerly the cottages were of the rudest construction—little better than hovels with earthen floors, often damp, and no division in the apartment except what was furnished by the box-beds of the cottager. Recently, however, a great improvement has taken place. During the last fifteen years fully two-thirds of the cottages in this county have been erected anew, and, in general, they are now in a very comfortable condition. The walls are higher, they have more than one window, and of proper size; they are in two or more apartments, with brick or earthenware pavement floors; also garrets with deal floors, which are available for many

useful purposes, and can be made comfortable sleeping apartments when required. The old class of cottages are now an exception in *Berwickshire*; also, I believe, in *Roxburghshire*." But a description of the house accommodation for farm servants in Scotland would be incomplete were a notice of the "bothy" omitted. This peculiar feature exists only in certain districts; and the evils, or assumed evils, connected with it have called forth an extraordinary diversity of opinion; and hence elicited very warm discussions—so much so, that I could present you with information in connection with these, the relating of which would absorb all the time allotted me. In place, however, of giving a *resumé* of my own, of all that has been said on both sides of the question, I prefer to place before you extracts from correspondents who have favoured me with their opinions on the subject. A gentleman in *Perthshire*, in which county the bothy system is greatly developed, thus writes me: "The 'bothy' is a house set apart for the men to sit in and cook their victuals, with a sleeping apartment or apartments adjoining. * * In many cases the bothy is badly kept, and the sleeping apartments dirty and untidy; but there is no necessity for this, and it is not inherent in the system. On the Home Farm at Windsor Castle there is a model bothy, and I know some in *Perthshire* kept in a similar manner, and when this is the case the men are extremely comfortable; and, where the men are unmarried, I should prefer the bothy system, under proper regulations, to that of giving the men their food in the kitchen (of the farmhouse). * * Where there is a bothy the men get their food, and keep by themselves; and when a woman arrived at the years of discretion is appointed to keep their bed-rooms in proper order, and the bothy clean, they are far from uncomfortable, and prefer it to going into the house for their food. As regards married men, the system is radically wrong. A married man should live in his own house, preside at his own table, and be the head of his family." A *Morayshire* correspondent writes: "The bothy, system, which is much abused, in a moral point of view, consists in giving a room or rooms, fire and light, with a certain amount of meal, milk, and potatoes, or an equivalent in money; besides the regular money wages. Where these bothies are well-conducted there is nothing objectionable against them, at least nothing more so than being fed in the farmer's kitchen. In a well-conducted bothy the master allows a female to keep the place clean, light the fires, bake the bread, and at the same time cleaning out the apartments and making the beds. You will therefore often find in these bothies every mark of cleanliness and tidiness, and at the same time furnished with books and periodicals. Such places as these the men like, and remain for years at the same place. On the other hand, there are other bothies where neither cleanliness nor order existed, and these places cannot be too much condemned. Farmers, however, are every day making arrangements with their landlords to build cottages for married couples; this is now the favourite system, and much to be commended." A *Forfarshire* correspondent thus writes: "Ploughmen are lodged in bothies, and furnished by the farmer with beds, bedding, &c. The accommodation has been deteriorating since the commencement of the last century, till it was reduced to a miserable pitch, the man being much worse lodged than the animals. Within the last five years a great change has taken place. Comfortable bothies are erected in many places, and new ones are constantly going up; and in a few years it is trusted that

all ploughmen will be comfortably lodged." Where the bothy is used in *Invernesshire*, "it is a clean-floored and neat room of considerable size, with the beds in the side, or frequently in an adjoining room." But the testimony given on the subject is not generally so favourable to the bothy system; indeed, the weight of evidence is altogether against it, as productive of an immense amount of social evil. A correspondent in *Caitness*—a county in Scotland, in which the bothy system can be examined in all phases—sends me the following, part of a report which he drew up on the subject: "A common arrangement of some bothies is as follows: The male and the female servants sit and eat and pass their evenings in the place where the lads sleep, and the females' sleeping-place is in some off-closet, entering from it or in a separate but adjacent apartment. Sometimes the sexes have separate apartments to dwell in, having different outer doors. These apartments may be placed on opposite sides of the farm court-yard. Not always, however, is there such accommodation. There are instances in which the males and the females sit, eat, and sleep in the same miserable place. Abundance of peats is allowed by the masters to the bothies, but neither lamp nor candle. I speak of the general practice; but I never heard of an exception. There is consequently no reading in our long winter evenings, and the darkness of the bothies encourages and facilitates deeds of darkness. This is the description of a bothy given by one of my reverend correspondents: 'A lad and a big boy and a single woman live in one room, which is badly furnished. There are two benches or forms, which supply the place of stools or chairs, but there is no table; the inmates make use of a chest lid as a substitute. There are two beds of coarse unplanned deals, and the interior is altogether uncomfortable.' The preceding description is, I have reason to believe, applicable, as to the fitting up, to numbers of our bothies. Their furnishing is for the most part wretched. All the sheets and blankets must be provided by the lads themselves, and all the bowls, plates, and spoons—all the dishes indeed, except the pot. Their food consists of milk, when it can be got, and oatmeal. Beef, mutton, pork, or fish, or flesh of any kind, they very rarely taste. The bothy may not be cleaned out or whitewashed for years, and their bedding is washed but seldom. In our bothies there is all but a universal sluttish and a slovenly disregard of cleanliness, order, and neatness." Calmly weighing all the statements *pro* and *con*., on the important subject of "bothies," I find that the evidence against them is very strong, while very nearly all that can be said in their favour is dictated, to a great extent, from notions of expediency. There can be no doubt, I should think, in the minds of everyone calmly considering the subject, that any system of housing which does away with the family influences cannot be a good one. The beneficent God, "who maketh families like a flock," has ordained the family institution as one which exercises the strongest influence and the best in man; and all attempts to substitute a mode of living opposed to this, cannot, from the nature of things, be good. We may modify the evils and get rid of some of the effects; but the primary cause still existing, these effects will every now and then crop out. I see, then, no method more likely to do away the evils of the system, than that the unmarried labourers shall be lodged in the houses of the married labourers, and that the number of married labourers should be increased. The system of lodging is carried out in the manufacturing districts, and I see no valid reason why it

cannot be adopted in rural ones. Failing this (and it must of necessity be a work of time to carry it out, involving as it does increased home accommodation), I see but one way of meliorating the evils—in addition to making the internal arrangements and construction in keeping with sanitary requirements—namely, for the farmer to exercise a steady and constant control and supervision over the arrangements and *goings on* in the bothy. By this, much of the benefits of the family system may be realized. There is more in the suggestion for increasing the number of our married labourers than appears at first sight. It is a pretty general testimony that married men make the best and the most trustworthy of servants. Nor need this be wondered at. But a slight knowledge of human nature is required to explain it. Much of the evils, I think, in connection with the condition of our agricultural labourers would be got rid of, if we could increase the number of married labourers, and secure good house accommodation for them. This latter is essential. I have thus presented to you a series of pictures—so to speak—illustrative of home accommodation in Scotland, and those drawn by artists on the spot, deeming it better to give these than sketches of my own. Time fails me to go over the wide range of English districts in a similar manner, I can but give a few sketches furnished me by esteemed correspondents. In *Dorsetshire*, "as to house accommodation," says a correspondent, "I believe it is nowhere worse than in this county. The cottages are the greater part mud-built and very small, and contain but few conveniences; and there are many instances where a whole family, sometimes quite a large one, have to put up with a solitary sleeping apartment—where the father and the mother, the boys and the girls herd together, to the total destruction of common decency, and consequently to the detriment of morality." A correspondent in *South Lincolnshire* says, "The poor are pretty well provided as regards home accommodation, though generally their houses are two small; and where a family is at all a large one, that leads to a sad state of immorality, from boys and girls, young and old, all being crowded together, and yet any increase of rent at once stops the labourers from attempting to lessen that seriously improper state of things." In *Essex*, says a correspondent, "cottage accommodation has been sadly neglected, but farmers are beginning to see that it is as necessary to have their labourers close at hand as it is to have their horses on the farm. The union of parishes has done away with the practice of pulling down cottages, or not erecting new ones, for fear the aged, sick, or infirm labourers should in their distress become chargeable to the parish which has had the benefit of their labours when capable of exertion. Landlords and tenants are too apt, even now, to look for profit from the housing of the labourer. This is a great mistake; for by huddling together the males and females in indecent propinquity, their health and morals become tainted, and re-act fearfully in various ways on the interest of both landlord and tenant. A suitable proportion of cottage accommodation should be attached to every farm, and at least one-eighth of an acre of garden ground will tend much to the comfort and morality of the labourer and his family." "One of the great existing evils," says a correspondent, referring to the state of matters in *West Suffolk*, "with the poor man, is a want of proper cottage accommodation; the miserable home, with but one bed-room and the sitting-room, is most prevalent; and you may travel through parish after parish, and scarcely find a cottage

possessing three bed-rooms; and so long as that is the case, however desirable the father of a family may be, or however much he may educate, we shall never find any moral or material difference; wages may increase, means of comfort may increase; but so long as whole families herd together, there can be no benefit morally. This brings me to the conviction that in the attempt to raise the condition of the labourer a wrong start has been made; and if as much pains had been taken with the cottage home as has been taken to provide school accommodation, much greater good would have been effected." "Generally," says a *Northumberland* correspondent, "a great improvement has taken place in their cottages." "The home accommodation," writes a *Bedford* correspondent, "is greatly improved in this county through the enlightened policy of our great landowner the Duke of Bedford, who has built some hundreds of model cottages; some landlords have followed his example, whilst others allow the rural population to live in hovels fit only for swine, and in which the moral senses of the young must become blunted." "The house accommodation," says a *Wiltshire* correspondent, "of the labourers of this county is far from what it should be. Of course (as in all agricultural districts) many of the cottages are old, and ill-constructed, having insufficient sleeping apartment for a proper division of the sexes: whole families are huddled together, to the destruction of all moral and virtuous feeling. It is generally on small properties, and where cottages belong to individuals whose only source of income is derived from the cottages, that we find the worst accommodation; still on some of the larger domains there are cottages that disgrace this fair land; but on the other hand I bear willing testimony to a much better state of things. I could name many influential landed proprietors who have expended large sums of money in erecting cottages on their estates, where good and ample sleeping accommodation, and every convenient requisite for a cottage is to be found, and let to the labourers at very moderate rents. I may state that there is usually a tolerably good garden attached to the labourer's cottage, and the allotment system is universal." It would be an easy matter to add to these sketches; but enough has been given to show that throughout England and Scotland the condition of the labourer's house accommodation may be described in one sentence: "Improvement is going on, but going slowly; badly arranged and constructed cottages, with deficient accommodation are too frequently, good cottages too seldom, met with." But before leaving this department of the subject, permit me to advert to two points in connection with it. The first of these is the system—having its origin in what are called "close parishes," where cottage building, from the action of the "law of settlement," has not been carried out—of having the cottages of the labourers at a distance from their work. I lately read in a country newspaper—a statement to the effect that a farm labourer in so many years had walked so many thousand miles to and from his work; and this was given in such a way as to convey the idea that it was an announcement of which one should be proud. For my part, I can scarcely find terms strong enough to denounce the suicidal folly and inhumane absurdity of this system. It is subversive of the best interests of the labourer, and, I may here add, of the landlord as well. It is neither more nor less than the purest absurdity to expect that efficiency of labour can be obtained when much of the physical vigour of the labourer is wasted by merely walking to and from his work. How

absurd would it seem to place the stables of a farm miles away from it, wasting the time and strength of the horses by going and returning therefrom! And yet is the labourer's time and the labourer's strength of less value than that of horses? It would appear that some have thought so. But what shall I say about, and how shall I characterise that reason, too often given on both sides of the Tweed, for not building proper accommodation on every farm for the labourers who assist in its cultivation, namely, "because it does not pay?" As well and as reasonably might landlords refuse to build the farm building; the one is just as necessary to the proper conduct of the farm as the other. If I, as a tenant-farmer, require good and healthy accommodation for my cattle, I certainly require it just as much for my labourers, who attend them. Is the health and strength of my servant a matter of no account to me? This might have been so, when labour was at a discount; but when it is at a premium, how vastly changed the circumstances! But this is taking the lowest possible view of the matter, merely referring 'it to that standard only—Will it pay. We must not overlook the higher consideration of the case. If property has its privileges to boast of, it assuredly has its duties to perform; no consideration of merely pecuniary interest can absolve the landowner from the higher claims which the labourer has upon him. He is placed over him, not as a tyrant to exercise rule, but as a just judge to exercise judgment, as a father, to show mercy and pity. I know of no position so grandly placed for good as the landlord's, and I am ambitious to see him in every district exercise it rightly. "Wealth ill used," to quote the words of the most eloquent of modern writers, "is as the net of the spider, entangling and destroying; but wealth well used, is as the net of the sacred fisher, who gathers souls of men out of the deep." At the same time the occupiers of land have a strong influence, which they can bring to bear upon the landlord, if they please. Let the farmers make it distinctly understood that they look upon good cottages for the housing of the labourers as important, in every sense of the term, as good farm buildings. Let them, in fact, point out that the machinery, so to speak, of a farm is not complete, where either defective buildings for stock, or for those who attend to them, exist on the farm. I am quite aware that in these days of competition for farms, there are these who gladly take them with defective buildings, rather than run the risk of not getting them by demanding those appliances which they know are essential. At the same time the farmers have it much in their power to influence the landlord on this subject of improved cottage accommodation; and it behoves them, for the sake of their material as well as their moral interests, to use this influence on all occasions. It should ever be remembered that in this matter of obtaining improved house accommodation for the labourer, he cannot help himself; this, from the nature of things, cannot be his work. He has a right to claim this accommodation; for in no sense is it just to demand from him the best of work and the most correct of conduct, when he is forced to remain under circumstances of continual operations, tending to incapacitate him for the one, and unfit him to maintain the other. So wide, indeed, is the subject now under discussion, and so comprehensive in its character, that I could go on filling up all my time, nay greatly more than that, by giving you its details. But I have already far exceeded the limits of this department of my subject, and must at once proceed to consider that of the *Education of the Labourer*. Time will not permit me to

do more than merely glance at the leading features of this important department of agricultural economics. The testimony is so far complete, that the ordinary branches of education—reading and writing—are generally within the easy reach of farm labourers' children; more especially in Scotland, where the excellent and well-known parochial school system gives great facilities to all classes. Evidence, however, is not the less convincing, that an unfortunate eagerness exists amongst the parents to take their children from school as soon as they can obtain work—no matter of how trivial a nature. The result of this is, that the children are only partially educated—in some cases so partially, that the lessons they receive are so evanescent in their nature that they shortly escape altogether from the memory. The truth then seems to be, not that education is so difficult to be attained—although we do not ignore the fact, that a vast deal is yet to be done *nationally* before education can be obtained by all—but that the time to allow of the education to be completed, or at least carried on to a useful stage, cannot be obtained, or, what is worse, will not be given. Hence, a movement has recently been commenced, having for its aim the establishment of the “half-time system” in rural districts. This idea is borrowed from the manufacturing districts of Lancashire, where, by Act of Parliament, not only are boys prevented from working in a mill under thirteen years of age, but by which also they are allowed so many hours a-day for the purpose of attending school and having recreation. We see much in favour and little against this plan. If education is worth having at all, it is worth while to make such arrangements as will enable it to be had in a proper way. And it certainly is a melancholy fact, that agricultural labourers value education so little, as to prevent their children possessing themselves of its advantages. The consideration of the expediency of legislative interference in such matters of social polity is not within the scope of this paper; but if the advantages of the half-time system are really established in the manufacturing districts, it is hard to see why similar benefits could not be obtained from it by its establishment—legislatively or voluntarily—in the rural districts. Masters have an immense power in their hands, of influencing agricultural labourers to appreciate the advantages of education. Let them make it distinctly understood, that a youth must be able to read and write before he will get employment, and that in the case of adults, the best work will be given to the best educated, and the labourer will soon learn to appreciate the value of education—such appreciation being, I regret to say, not by any means general amongst them. The system of education—such as it is—obtainable by the agricultural labourer, is not as yet generally adapted to give him that distinct and peculiar species of knowledge useful to him in his daily avocation. Agricultural education, strictly so called, is, in point of fact, rarely given; hence, a general ignorance amongst labourers of the very first principles of the art which gives them subsistence. It is here, I think, quite unnecessary to point out the advantages derivable from a knowledge of the principles of agricultural science; one point only may be adverted to, and that is the interest which this knowledge would create—the farmer would find in his servant a readier help in carrying out improved modes of culture or farm processes, instead of the prejudiced sneer, or the helpless, hopeless, indifference which meets him too often now, when he is introducing new things. Knowledge gives

a man a quickening interest in the processes in which he is engaged, and an interested man will make a better servant than an indifferent one. In proportion as we find a man elevated in his ideas, just in proportion are his services rendered of the higher value. We find this to hold true in other callings: why should it not in that of agriculture? At the same time, I must not conceal what, I find, is the opinion of a considerable number of my correspondents, and which I know also to be held by many farmers throughout the country—namely, that this superior education of the labourer is not required. On the contrary, it is in no way to be desired, inasmuch as it seems—so they think—to unfit him for his work, raise him above it, in point of fact. If, then, this is the case, and that a cultivated intellect and the routine of farm labour are incompatible, let us hope for the rapid realization of the period when much of its mechanical drudgery shall be done by the aid of improved modes of working, in which the work of human sinews shall be done by the untiring aid of the steam-engine, and the unfettering of the body of the labourer from dull and dreary work, shall leave him free to carry on processes demanding more of skill, and a wider exercise of his intellect, than is now the case. But, whatever education is, it should not, I conceive, be that which has reference to the cultivation of the intellectual powers only. I do think that the present tendency of education is too much in the wrong direction—getting up the polish, the pith of the man and woman is neglected. The heart requires proper training, as well as the head; and in this direction, the lessons of the school may be ably supplemented by the precepts and examples of the hearth—the labours of the teacher in the school aided by the authority of the parents at home. To this end, the parent must become himself a ready and willing scholar in the school of self-discipline, self-control, and self-denial. Ever aiming at self-improvement, he will best be able to improve his children; and, ever learning, he will make all the better teacher. But, to complete the education of the labourer, another thing will still be wanting—namely, the teaching of example, this being carried out by the master. I have, assuredly, a strong conviction that an immense amount of good will be effected by raising the social condition of the labourer, by the persistent, every-day-displayed example of masters whose daily life proves that they themselves are actuated by the highest of motives and the purest of principles. The whole gist of the matter in this direction is pithily put by a correspondent, himself one of the ornaments of the agricultural world, who says that “the master is the true educator of the servant, and that in the long run, and on a large scale, the master will be served *just as he deserves*.” Worth thinking of, this, fellow-members of the Club. As indicative of what practical men think of the question of education, I give here an extract or two from the communications of my correspondents: “There can be no doubt,” says a correspondent, “but the labourers are much better educated in the agricultural districts now than formerly. Schools have been built, within the last few years, in almost every village, either under the inspection of the Government officials, or by the clergy or some influential landowner; but in many of these schools, it has been found from experience, the children have been taught much that proves but of little advantage to them in after-life, and the more useful knowledge has been sadly omitted. This applies more particularly to females. It has also been found that, since a higher-class education has been imparted to the labourers, the less are they inclined for the mere labourers’

work of the farm; and, up to the present time, I do not find they are more able to undertake skilled labour than they were years since, except in some instances, when they get the advantage of the alteration of masters able to give them lessons in the several branches of such labour." Another correspondent states: "As regards education, I do not think the lower classes appreciate the efforts that are being made throughout the country for their advantage. Many might send their young children to school; but they neglect to do so. I do not advocate a boy being kept at school after he is eleven years of age, except the Sunday-school, or perhaps twice in the week at evening-school, if he is to earn his living by field-work. It is only those who go to work young that make good labourers. A highly-educated boy of fourteen would not like the A B C of farm-work." Another says: "I am not quite sure that the education going on at present is a step in the right direction. So far as teaching reading and writing, but one opinion can exist—that it is right; but here they are taught, especially girls, every kind of tom foolery that can be thought of—crochet, fancy needlework, geography, use of the globes, and much else which is not useful." Another says that his experience goes to prove that the system of education adopted, more especially at the National Schools, is set too high above the general minds of the pupils; and that, while efforts are made to bring out the talents of the quick, the slow pupils are left behind. Thus the masses are anything but well educated. Another correspondent states: "I think I may say nearly every parish has its good school accommodation—in many instances in superfluity; for I call all beyond *reading well and moral training* superfluous to the pauper scholar—firstly, that it unfits him for his calling in life; and secondly, and chiefly, that ratepayers, to a very considerable extent, are unable to educate their own children to the extent that they are called upon to contribute to the education of children in the class beneath them. Yet, with the facilities offered, a very great number of children (of course, through the neglect of their parents) receive no instruction." "Life in every shape," says a German writer, "should be precious to us, for the same reason that the Turks collect every scrap of paper that comes in their way, because the name of God may be written on it." It will be a great day, Mr. Chairman, for our country, when, through the education of the intellect and the heart, our agricultural labourers shall be prepared to have "God's name" written on them.

I now proceed to the next department of my paper, in which we glance at two of the principal modes by which an agricultural labourer can offer his services to expecting or waiting masters, these being *hiring markets and statute fairs*. In Scotland, hiring or feeing markets are very general. They are usually held twice a year, at the county or chief town of the district; and as on these occasions a large number of people assemble, and old friends and cronies meet after months' absence, drinking is carried on, and other vicious scenes enacted. The consequence of this is, that a very decided and somewhat warmly-carried-on crusade has been commenced against these markets: a warm discussion has been, and is now, going on eliciting doubtless a great array of facts, very dreary and melancholy, inasmuch as they show the evils attendant upon these meetings. Far be it from me to ignore the fact that these evils exist, or to in any way detract from the importance of the measures which propose to get rid

of them; but it appears to me that there is a fault in the mode in which the discussion is carried on, by thus being desirous of doing away with hiring markets. I refer specially to the point which they generally assume, namely, that all the evils are inherent in the system, that it is in every way bad, and that it cannot by any possibility be good; ignoring the fact, that these meetings simply give the opportunity, and, I admit, supply in great measure the temptation, which enables the labourers there assembled to carry out their orgies. If with a full sense of the dignity of labour and the worth of moral manliness, those attending them would determine that they would not drown their senses in a flood of drink, would not the evils altogether or nearly cease? If our merchants can meet on "change" and yet carry on no public exhibition of vice and degradation, what in the nature of things prevents our labourers from attending hiring markets and statute fairs, their change, and displaying the same order and decency? Nothing indeed, but the exercise of self-control and of Christian principles. Seeing the evils which undoubtedly arise from these markets as at present carried on, and gladly granting that prevention is better than cure, and that it is better not to lead our fellow-men into temptation, I would be glad to see them abolished if they cannot be improved, as some maintain they cannot. But perceiving that several practical conveniences attend upon their establishment, and not a few inconveniences would follow their abolishing, I would gladly hail all attempts on the part of the masters to lessen the opportunities which they afford for the carrying out of vicious practices of the servant; but at the same time I should like to see those who are so eagerly denouncing them, as if all the sin lay at the master's door, point out decidedly to the servant that he has, at least, some influence in bettering them; that as it is his excesses which makes them such evils, it is probable, to put it mildly, that his forbearance and self-control would on the other hand greatly mitigate these evils. So far as the practice of hiring markets is concerned, I am free to admit that I think it a wrong one, a clumsy, inefficient way of carrying out the desired end. On this point one of the most distinguished agriculturists in Scotland writes to me as follows, as regards the hiring market in his own neighbourhood, "It has been most prejudicial to both masters and men. Servants are hired not for their character, but from their height and breadth of their shoulders; in fact, it is impossible in a market to obtain a character. No consideration would induce me to hire a man in a market. You cannot be in contact with a man for 12 months without affecting him or being affected by him, either for the better or for the worse. He will do something to excite your anger, or you will raise his wrath, without the most judicious selection. When I want a man I let it be known, and as yet have always had the offer of service to choose from. I have seldom any changes, while those who go to the market get new servants almost every year." A committee of the Highland and Agricultural Society was appointed to "consider and report as to the various methods in use for procuring the engagement of farm labourers, male and female, and whether it may not be possible to dispense with hiring markets." Taking the information supplied by correspondence, the committee reported that the methods in use for procuring the engagements of farm labourers appeared to be the following: 1. By private hiring, which seemed a very common method of hiring, and in many districts almost the only one. 2. By private

hiring in combination with hiring markets, some farmers using the hiring markets only as a last resort. 3. By advertisement, a mode which was sometimes used with good effect. 4. By private hiring along with monthly or short engagements. 5. By registers, which seemed to exist in a good many places, but were mostly of recent origin, and were not very extensively used. 6. By hiring markets, which is the method at present most extensively used. It seemed to be the general opinion from the returns, that hiring markets are not in a very satisfactory state, but there was very considerable difference of opinion as to what was to be done in reference to them. Among the suggested improvement be of hiring markets were—the drinking-booths should be abolished, and refreshments provided on a large scale on temperance principles; that only men should be engaged at the markets, and the women privately; that the market should close early in the afternoon; that they should be retained along with registers; and that farmers should employ married men as much as possible, as in Berwickshire and Roxburghshire. The committee, after having carefully considered the whole subject, had come to the following conclusions:—"1. That while hiring markets, as at present conducted, seem to be very generally condemned, any practical measures to be adopted by the Highland and Agricultural Society on the subject of re-engagement of farm labourers must be gradual work, depending to a large extent on the progress of public opinion. 2. That the practical measures which our committee have to recommend are accordingly suggested with the view, not of coming at present to any definite or final conclusion on the subject, but of keeping it before the public attention for some time, so that the public may have an opportunity of considering it fully and in all its bearings, and of arriving at mature and sound conclusions. 3. That your committee have accordingly to recommend to the Directors and to the Society that the prizes be offered by the Society with reference to the subjects specified. 4. That while your committee propose in this way to keep the matter under public attention, they would strongly recommend Local Agricultural Societies, Farmers' Clubs, and individual farmers to proceed at once to make experiments of the different modes of hiring suggested in the returns, with the view of ascertaining for themselves, and of giving the Society the advantage of a larger and more extensive experience than they now possess. 5. That while your committee believe the above conclusions are all that the present information justified them in arriving at, they think they are also justified in saying that as the returns show a very wide-spread dissatisfaction with hiring markets, it is incumbent on employers in their several spheres to foster and encourage the growth of mutual respect and regard between them and their servants, and to take a kindly interest in the welfare, prosperity, and happiness of those in their employment, your committee being assured that on such farms and in those districts where such feelings largely prevail, the tone of society is higher, changes are less frequent, and hiring markets are less frequented." As regards the "statute fairs" and "mops" in England, the same opinion pretty generally prevails, as I have already expressed in connection with hiring markets in Scotland. Much of what can be said on both sides of this subject is nearly comprised in the following extracts from one or two letters I have received on the subject. "There has been," says one, "a great desire to put an end to those hiring fairs, on the part of the clergy and others.

They are no doubt the scenes of great immorality and vice, are attended with much evil, and tend to make servants unsettled in their situations. Several fairs have been discontinued, and registering-offices have been opened in the small villages; but the alteration has been so lately made, that the effect can scarcely be stated at present." As regards the comparative utility of these statutes and registers, a correspondent, who while denouncing statutes as "most serious evils," states that "the hirers generally want more servants than one, and might not succeed at the registry-office, so prefer attending the statutes. Another thing is, they see the servants and their late master at the same time." The doing away with the statutes, he further says, "is mainly in the hands of the masters—for if they refrain to go to hire, the servants would cease to attend them." Another correspondent energetically states his opinions thus on the subject: "A great deal of bosh has been uttered by a lot of * * * meddling muddle-headed clergymen in reference to statute hiring. They had far better let us farmers alone * * *. No reasonable objection can be urged against the system. Its use is undeniable, its abuse to be regretted, and very easily reformed. The grumblers * * * say young men and women congregating for such a purpose must necessarily lead to immorality; any gathering of such a kind for any other purpose would, I presume, have the same effect. Here, if there were no statutes, they would still congregate and have their holiday; and why should they not? Many farmers in this county keep from 10 to 30 or even 40 yearly farm-servants; if there were no statute gatherings, how are they to be obtained? A register-office is a farce. We already know that such a system is the curse of the present scheme of getting household servants, and with ploughmen it would be incalculably worse."

The next point we have to discuss is that of *Wages*. There can be no doubt of the influence which the amount of a man's wages exercises upon his position in society. It is very gratifying to think that in this respect the labourer's position is wonderfully improved; that he has at last the prospect of getting—if he has not in many districts already got—a fair day's wage for a fair day's work, not the poorest of pay for the hardest of work, which was his lot not so many years ago. But increased wages should bring on the part of the labourer increased care of his resources—not induce, as is too often the case, reckless expenditure and waste. He "must strive to arrive at"—and here I may be permitted to quote from an article I furnished to the *Mark Lane Express*—"an appreciation of the dignity of economy, and become convinced that there is more meanness in the waste that brings want, than in the saving which brings security against it. It is not mean to be economical, or stingy to be saving, as is too often said by the poor while stigmatizing the habits in those directions of the middle classes and the rich. We must get before we can give; to be charitable to others we must be careful ourselves. The poverty which comes from want of prudence deserves no pity, and the sorrow which arises from self-indulgence no sympathy. "Much food," says the proverb, "is in the tillage of the poor, but there is that is destroyed for lack of judgment." It is not, after all, by the amount of a man's earnings, but in that of his savings that his wealth is to be estimated. A working man saving half-a-crown a-week is in reality richer than he who with an income of a thousand a-year saves none. This is a truism, but it belongs to the class of truisms which I should like to see working-men pay heed to. While on the

subject of wages, I venture to hope that ere long the payment of "wages in kind" will be abolished. I throw out this suggestion with considerable hesitancy; for I am well aware of the conveniences of the practice, and of the reasons which can be offered for a continuance of it; but it appears to me that the fairest way is to pay services in the current coin of the realm, leaving the servant to do just as he pleases with his wages. None of us, I take leave to think, would like to be paid in the way in which some of our farm-servants are paid. There is a species of constraint and of forcing about it not consonant with our notions of true British liberty; for the servant has no choice in the matter—it is not with him which of two, but this or none—"Hobson's choice" truly. We all know how the "truck" system in the manufacturing and mining districts led to evils so great that legislative interference ultimately put a stop to it. Now the system of paying wages partly in money and partly in kind, practised in some of our farming districts, is something of the "truck" system, modified doubtless, and not capable—at least I do not think it will ever be made so—of producing the evils which the "truck" system in the manufacturing districts produced; but I nevertheless feel that it would be better if the simple principle of paying money for services were adopted in all our rural districts. As I said just now, I throw out this with considerable hesitancy, and more by way of inducing thought and discussion on the subject, than of urging it as a necessity or a right to be expected by the labourer. In connection with the subject of wages, while on the one hand gladly seeing the better and daily bettering position of the labourer, I regret bitterly to see on the other a desire here and there, on his part, to introduce the baneful practice of "strikes." Wherever this unhappy tendency is seen to develop itself—and I much fear that its development will, if things go on as they are now going, progress pretty rapidly—every means should be taken to disseminate the true principles of economy amongst the labourers; to show to them that "strikes" benefit no one, but do an immense injury to both parties. I confess I am not at all surprised that this desire to initiate "strikes" should show itself in our rural districts, but I am not the less pained to find that it is so. The evil if possible should be nipped at its early stages, and not allowed to assume such dimensions as to make its removal a matter of great difficulty. It is not for me here to suggest the mode in which the evil can thus be stopped at its early stage. As regards the rate of wages, modes of payment, &c., now existing in various districts of England and Scotland, I have received a comparatively complete series of statements from numerous correspondents; time altogether fails me to give these in the words of my correspondents. I therefore fall back upon a very valuable return given lately in the pages of the *Agricultural Gazette*, and from which I have prepared—with the kind permission of the editor—the following brief statements. These have reference to the wages of able-bodied ploughmen only, time not permitting me to give those of shepherds and labourers employed during harvest time. These will be found by reference to the No. of the *Agricultural Gazette* for April 28th, 1860. Taking the counties of Scotland given in the return, we find the rate of wages as follows: *Inverness*, £13 yearly, with free house. *Aberdeen*, £22 yearly, with board and lodging. *Elgin*, 7s. 6d. weekly, with food; and £13 10s. yearly, with 3 bolls of meal, house, fire and light free. *Forfar*, 8s. weekly, with perquisites equal to 7s. 6d. weekly; also 12s. per week. *Fife*, 11s. 6d. weekly,

Stirling, 13s. to 15s. weekly. *East Lothian*, 12s. 6d. weekly, paid in grain and cow-keep. *Mid Lothian*, £21 yearly, with 1,050lbs. of oatmeal and 96lbs. of potatoes, coals carted, four weeks of food at harvest, and house free; also 13s. weekly. *Ayr*, 12s. weekly. *Roxburgh*, ditto. *Berwick*, 11s.; and *Wigtown*, 14s. weekly. Taking in similar manner the counties of England given in the return, we find the wages of able-bodied ploughmen to be as follows: *Northumberland*, 15s. weekly, with perquisites worth 3s. 6d. a-day extra in harvest, with a few presents at Christmas; also 15s. weekly, with 2 bushels of wheat, 2 bushels of barley, 30 stones of potatoes, house free, and coals carried. *Cumberland*, £18 yearly; also £21 yearly, with food and cottage. *Durham*, 15s. and 12s., with four tons of coal. *Yorkshire*, 14s. weekly; £17 yearly, with meal. *Lancashire*, 15s. weekly. *Derbyshire*, 14s. weekly. *Notts*, 10s. weekly, with rations. *Cheshire*, 12s. to 14s. weekly. *Lincolnshire*, 10s. to 17s. weekly. *Shropshire*, 11s. weekly, with 2 quarts of beer a-day and fuel hauled. *Warwickshire*, 12s. 6d. weekly, with one quart of beer per day; also 11s., with house and garden free, potato ground free, beer and double wages in harvest. *Rutlandshire*, 12s. 3d. weekly, with one quart of beer a-day. *Leicestershire*, 12s. weekly, with cottage free, coal hauled, and sometimes 2 bushels of malt. *Staffordshire*, 10s. weekly. *Northamptonshire*, 12s. weekly, with beer, and 6d. for every 10 quarters of corn delivered. *Worcestershire*, 11s. to 12s. weekly, with 2 quarts of beer a-day, and 20s. extra at harvest. *Herefordshire*, 10s. weekly, with cottage and garden worth 2s. 6d., and cider daily worth 20s., and in harvest 3s. 6d. a-week; also 10s. weekly, cottage, garden, cider, and potato ground, with 4s. a-week. *Monmouth*, 10s. weekly, with cider and ground equal to 2s. extra. *Gloucestershire*, 11s. weekly, with cottage 1s., beer 1s., and 20s. harvest. *Oxfordshire*, 12s. to 15s. weekly. *Berkshire*, 10s. weekly, and 20s. at Michaelmas; 9s. weekly, with house and garden free, potato ground free, beer and double wages in harvest. *Bucks*, 11s. to 14s. weekly. *Herts*, 12s. weekly. *Cambridgeshire*, 10s. to 11s. weekly. *Norfolk*, 10s. 6d. weekly. *Suffolk*, 10s. weekly, with perquisites. *Essex*, 12s. weekly, house free; also 11s. and 12s. weekly, with beer at certain times. *Sussex*, 13s. weekly, beer when carting, and £1 at harvest. *Hants*, 10s. to 12s. weekly. *Dorset*, 8s. weekly, house and garden, potato land ploughed, fuzg faggots, carriage of fuel, 20s. for harvest, and beer 1s. journey with team, beer at hay-making, and wheat at 6s. per bushel; also 9s., with perquisites. *Somerset*, 10s. weekly. *Wilts*, 9s. to 10s. weekly, with cottage and garden free, 4 bushels of malt, and 1s. per 10 quarters of corn delivered; 9s. weekly, with harvest money 65s. *Devon*, 11s. to 14s. weekly. *Cornwall* and *Carmarthen*, 12s. weekly. Having now glanced at the house-accommodation and the education of the agricultural labourer, the mode by which he can offer his services to the farmer, and the way and degree in which he is remunerated, I propose very briefly to advert to the recreations of the labourer, and to the facilities which are offered him for spending his spare time. I regret to say that, so far as I have been able to ascertain, these facilities are very few, and not always of the best of character. In many districts the spare time of the labourer is miserable in amount. Labour, if rightly directed, should give to him who exercises it, not only wherewith to provide for the necessities, but also for the rest and the luxuries of life. The condition of the labourer is truly painful and that of society unsound where "the time for rest is swallowed up in labour." A

movement has long been in progress, and attended with the happiest results, amongst various classes of the working men of Great Britain, to obtain a certain amount of leisure time. I should like to see this movement inaugurated in the rural districts. I am aware that it has been so in some, but it is not by any means general. But what I should better like to see would be a voluntary offer on the part of the masters themselves to give to their servants more time for rest and recreation. In many districts the only holidays obtainable are the days of the hiring markets; and so strong is the desire to have these, that I believe many would rather give up their situations, if that were necessary, than miss them. Nor is this to be wondered at: the desire for excitement is strongly implanted within us: "all work and no play makes Jack a dull boy"—a homely proverb, but none the less truthful and suggestive. But in giving time for recreation, it behoves us to see that the recreation be sound and healthy. It is, in truth, a bitter satire upon all our fine talk at raising the condition of the labourer, to reflect that, too often—shall I say that it is the general rule, and the reverse the exception? I think I might with safety do so—the beer-shop is the only place of attraction in which the ordinary, and that of the hiring market, statute fair, or harvest homes the extraordinary recreation of the labourer can be carried out. It is, however, gratifying to be able to state, that things are rapidly improving in this respect. The garden, and cottage allotment systems, the reading-rooms, the itinerant libraries, the play-grounds, &c., which are rapidly becoming common throughout the country, will in time offer to the labourer recreation of a high order, and do much to rouse his ambition and stimulate him to occupy a higher position in society, till at last the realization of the poet's wish may be brought about, that

"A virtuous populace may rise the while,
And stand a wall of fire, around
Their much loved isle."

Little time will suffice to advert to the means adopted by the labouring classes to provide for the period of life when capability to labour fails. It is painful to look back upon the past times of the agricultural labourer, when, with miserably low wages, the almost inevitable result of a life's time of labour was a death in the pauper's ward. With increased wages let us hope will rapidly come increased care, so that the labour of maturer will minister to the rest of failing years. With reference to extension of the system of benefit societies, a correspondent in West Suffolk writes me to the following effect: "An excellent system is being pursued by the Board of Guardians in denying as much as possible relief to young able-bodied men who are not subscribers to enrolled benefit societies. And I think masters would do well to pursue a course with lads on their farms, which myself and many others are pursuing, to make it a condition with an increase of wages, that they should enter an enrolled benefit club. It makes them more careful over their employment, and once entered they are most anxious to continue; and it also tends much to respectability." Would not, I may here ask, an extension of the "Penny bank system," so successful in the manufacturing districts, be equally advantageous to our rural population. Anything tending to increase the sense of responsibility on the part of the labourer is valuable in raising him in the social scale. The phrase, "a stake in the country," is pregnant with meaning.

Rapidly failing time warns me to conclude; and I do so with the expression of a deep sense of the deficiencies of my paper. The subject is so many-sided, presents so many aspects to our notice, is mixed up with so many complex considerations, that to do justice to its requirements is a matter of extremest difficulty. I freely confess that I am unable to master its intricacies, for the little I know on the subject only shows to me my ignorance of its deeper details. At the same time I owe it to you who have honoured me with the position which I now occupy, to say that what I do know has been gathered not from an outside-far-off-view merely of the subject. I have at times worked with workmen at the bench and with the labourer in the field; I have been with him in his rest, and have followed him through his recreations; and have thus had some opportunities of becoming acquainted with his feelings, modes of life, and aspirations. Whether I have taken the fullest advantage of such opportunities is quite another thing, I confess to feeling that I have not. On the other hand, I know somewhat of the farmer, and have spent with him some of the happiest and most improving moments of my life. What I say, then, is founded upon convictions derived from some experience—however [narrow—of the peculiarities of the position of both parties interested in this great question: the master as well as the man. I have not hesitated to state plainly what these convictions are, being equally decided where I have had to point out the shortcomings of the master, as well as the failings of the man. I have said that the difficulties attendant upon a right solution of the question, or rather questions, are numerous; they are indeed so, for no sooner do you find that you have got rid of one than up starts another. And yet I foresee one way in which these difficulties can be met and overcome; and that way the speediest and the best. It is the application of the principles of Christianity to the matter. I am no advocate for the introduction here of sectarian views; I mean the pure Christianity of the bible—that Christianity which is broader than any sect, wider than any so-called church. When we are environed with difficulties as to our mode of action, it is astonishing how rapidly these vanish, and how plain is the path of progress, when we take the leading ideas—the main principles of Christianity for our guide, which tell us in language so plain that he who runs may read, "Do unto others as ye would that they should do unto you." And, again, "He who knoweth to do good, and doeth it not, to him it is sin." These are the touch-stones which will test whether the metal we offer is good or spurious—the true philosopher's stones, which will turn our dross into bars of the purest gold. I confess to being ambitious for my countrymen. I should like to see the landowner and the master both vie as to who should do the most in fulfilling the high requirements of their stations; but I would not the less like to see the labourer do his part, by the exercise of a continued self-improvement to raise *himself* in the social scale. I foresee great things for our rural labourers when this union of effort shall be carried persistently out—when the endeavours of the one shall be aided by the anxieties of the other, and the progress of both shall be rapid, and know few backward steps in that path which can alone lead to true individual happiness and real national greatness.

Hastily as I have run over some of the points connected with the condition of the agricultural labourer in England and Scotland, much time, nevertheless, has been absorbed;

it is quite impossible, therefore, in what is left of the time given me, to do justice to the department of my paper connected with the condition of the labourer on the continent. I can, therefore, only glance at one or two points in connection with it. The system of small farms (*le petite culture*) so generally prevalent throughout the continent, markedly so in France and Belgium, induces a condition of things vastly different from that prevalent in this country; and hence we find that the class of men who hire themselves out for farm labour is not in any way so important as the class with us. Farm labourers are not numerous, as large farmers requiring their services are anything but numerous themselves. Their place is taken by the body of peasant proprietors, who may be said, in general terms, to represent our agricultural-labourer class. I have travelled pretty extensively on the Continent, and I confess to having formed a very favourable opinion as to the condition of the agriculturists of the lower ranks. Time will only permit me however to glance at their condition in Belgium; more especially that part of it—Flanders—where cultivation stands so deservedly high. Wages are not great; a farmer in the neighbourhood of Courtrai, who farmed about ninety acres, told me that he gave his labourers 67 centimes a day, that is about 7d. per day, with an ample supply of provision—meat, bread and soup. From a franc to a franc and a quarter may be stated perhaps as the average without provisions. Nearly all the labourers have small plots of ground, which they have time to cultivate, and which they do with the most pains-taking care. That the condition of the labourer is in every way a comfortable one, even a cursory investigation will easily show. The clothing is wonderfully good, far above—especially in the linen department—that of our labourers. In the districts where the small plots of land are cultivated by the present proprietors pleasant signs of personal and household comfort abound everywhere. The village-streets through which one passes show little of the squalid untidiness which too often greets the eye of the traveller in this country; and seldom is he offended with the sight of children bouncing about in all the Arab freedom of dirt and rags which characterizes too many of the rising youths of our own villages. Nor, let me add—which possibly is one grand reason of all this comfort—do you see the drunkard staggering through the streets in the hopelessness of confirmed degradation. The cottages are small, and scantily furnished, according to our ideas of furnishing; but a scrupulous cleanliness atones for this, and adds a charm which abundance of furnished wealth without it would not give. The personal dress of both sexes gives you the idea of great comfort, although in the materials employed you have no evidence of the abundance of money. It simply tells of small funds laid out to highest economical advantage, than which nothing I conceive is more satisfactory in peasant life. Not to tire you with opinions of my own, I give you those of an authority who has had ample opportunities of studying the manners and customs of the Belgian peasantry—opinions which a somewhat lengthened sojourn in the principal districts enables me fully to endorse. "The labour of the field," he says, "the management of the cattle, the preparation of manure, the regulating the rotation of the crops, and the necessity of carrying a certain portion of the produce to market, call for the constant exercise of industry, skill, and foresight among the Belgian peasant-farmers; and to those qualities they add a rigid economy, habitual sobriety, and a contented spirit, which finds its chief gratification beneath the domestic roof, from which the father of the family rarely wanders in search of excitement abroad. It was most gratifying to observe the comfort displayed in the whole economy of the households of those small cultivators, in the respectability in which they lived. . . . The provident habits of these small farmers enable them to maintain a high standard of comfort. Their marriages are not contracted so early as in Ireland, and the consequent struggle for subsistence among their offspring does not exist. . . . The Belgian peasant-farmer is not

very different from the small Irish occupant as regards his position in society, but he is in a far better condition as regards the comforts and conveniences of life; and the causes of this difference are to be found in the more skilful system of culture pursued by the six-acre farmers of Belgium, in the rigid economy which characterises them as a class, and in the persevering industry, providence, and thought which enables them to adjust their limited resources to their wants." Another authority states "There is an appearance of comfort in these little farms which is very pleasing. Hard work, instead of being here thought an evil or a hardship, is thought essential to the health and comfort of the individual. The children are brought up in industry; it is interwoven with all their associations; and when the young men marry, they find wives who are brought up in the same manner, and are useful helpmates to them. . . . There are many small proprietors who have risen slowly by the labour of their own hands; and their habitations show, by their extreme neatness, and the care taken of everything about them, that they feel a pride in enjoying the just reward of honest industry."

In conclusion I will here take the opportunity to thank those gentlemen, who—with a fulness of detail worthy of the highest praise—have corresponded with me on the subject of my paper. For obvious reasons I do not append a list of their names; suffice it to say, that they are all gentlemen, who from their practical position are entitled to be looked upon as authorities; many of them have reputations, world-wide in the annals of agriculture; and I can only regret that time has not permitted me to give their communications *in extenso*. Abounding as they do in practical information, and in the suggestiveness of their details, their publication in this form would have been highly valuable.

Mr. J. BRADSHAW (Knowle, Guildford) said the subject which had been introduced that evening was, as they must all feel, one well deserving of discussion. The improvement of the agricultural labourer of this country was surrounded with difficulties. In the first place, let them look at the labourer's cottage: that must be made part and parcel of the land. How could a man in the receipt of only 11s. or 12s. a week afford to pay more than 1s. or 1s. 6d. a week for rent? whereas many a man in that position was now called upon for 2s. 6d. or 3s. The cost of building was a point on which he had bestowed great attention. In his opinion it was hardly possible to erect two cottages, with three rooms each, for less than £240; and how, then, could they be raised, except at the expense of the landlord? He had not himself a single cottage let at more than 1s. per week; but there were cottages in his neighbourhood—poor, paltry things they were—let at 2s. 6d. As regarded education, he was happy to be able to testify that in many agricultural districts the attention which was now being paid to education, and the progress now being made in it, were most satisfactory—quite equal, in fact, to anything of the kind that was seen in the manufacturing districts. Allusion had been made by Mr. Burn to the fact of a labourer in Belgium receiving his 75 centimes per day, besides an ample supply of provisions. The only two countries on the continent, that he was aware of, where the cultivation of land in small holdings was carried on successfully, were Belgium and Lombardy. And why was the system successful in those countries? Because the people were favoured with a good climate and a light soil of a peculiar kind (Hear, hear). He knew those countries well, and had examined their soil for himself. With respect to France, he would observe that in 1858 he went over a farm situated about six miles on the other side of Versailles, and there he learned that the wages of labour—he would not express any opinion as to the comparative value—were quite equal to those paid in many parts of this country; they amounted to about 12 francs a week. He quite agreed with Mr. Burn that the elevation of the labourer in the social scale could not be accomplished without the agency of steam cultivation (Hear, hear). Farmers had now to compete with all the world. They could not afford, therefore, to increase the rate of wages unless they could manage to produce at a cheaper rate, and this he was firmly convinced could only be done by means of the application of steam to the cultivation of the soil

(Hear, hear). Wherever the use of steam was introduced, it would tend to improve the social condition of the agricultural labourer; of this he had become thoroughly satisfied by experience and observation on his own farm.

Mr. EDMUNDS (Rugby) said that subject was necessarily one of deep interest to all of them. Everyone who had seen the *Times* of that day must have observed that another great blow had been struck at the agricultural interest (loud cheers), the main object being evidently to depreciate the agricultural as compared with the manufacturing districts. Now, having lived in the midland counties, and been a member of a board of guardians for some years, he denied that the condition of the labourers there was as bad as some persons would have the public believe. He admitted that much more ought to be done for the benefit of the labourer; but still he maintained that the subject should be regarded in a practical point of view. Whoever knew what was the state of things 30 years ago must feel that there had been great improvement since that period. He would appeal to any impartial person whether manufactures or commerce—whether any interest had made as great strides as agriculture had during the last 30 years. Where would the Ransomes and Howards have been 30 years ago? Where would such men be now if they had not intelligent and improving agriculturists to deal with? (Hear, hear). He granted that the benefit was mutual; still the fact remained that the farmers of the present day were very different men from the farmers of the period to which he had referred, and so surely as the farmers were elevated as a class, must the labourers be, to some extent at least, raised along with them. If they wished to receive the full benefit from the implements now in use, they must have intelligent labourers to manage them. The first essential in the improvement of the labourer was the improvement of his dwelling (Hear, hear); but that was not so much a tenant's as a landlord's question. Wherever they found a good landlord, there they found also comfortable cottages, good schools, and efforts to make the labourer what he ought to be; but when an estate was overburdened, and would hardly keep the proprietor, how could it be supposed that it would keep the peasantry? (loud cheers). The first grand requisite was, he repeated, for the labourer to have a proper place to live in. No cottage ought to contain less than three rooms. One evil which had often struck him was that the sewage from the cottage and from the pigsty was often seen running close to the labourer's door; that was an evil which might surely be easily remedied. It was the duty of the parish authorities in all such cases to make representations in the proper quarter (Hear, hear). Moreover, all the inhabitants of the neighbourhood were interested in the matter. So long as the labourer was at work in the fields, the sewage might not much affect him; but if he got into an ailing condition, he might soon have typhus fever, which would perhaps spread from the cottage to the farm-house, and from the farm-house to the abode of the landlord. The subject of education was also well worthy of serious attention. He would ask any member of a board of guardians to compare the condition of the pauper's child in the workhouse, as regarded education, with the condition of the child of the labourer, who was maintaining himself and his family out of the workhouse. Was not the condition of the former preferable to that of the latter? (Hear, hear.) Did it not generally receive a much better education? (Hear, hear.) In his own neighbourhood an immense amount of good had been done by night schools. In the winter, boys employed on the farm generally left off work by 5 o'clock, and there was nothing to prevent an hour or an hour-and-a-half being devoted to the work of education.

Mr. T. B. BROWNE (Salperton Park, Andoverford) said no one present could doubt that the duty of providing proper cottages for farm labourers devolved upon the owners, and not upon the occupiers of the soil. As regarded the cost of a good cottage, he did not concur in the estimate of a preceding speaker. As a landlord, he had had some experience in that matter, and he was of opinion that a very good cottage might be built for about £70. With respect to rent, he believed that taking the country generally—there might, of course, be exceptions to the rule—the average amount was 1s. per week. In a few

districts perhaps it was 1s. 6d. There was one difficulty connected with this subject. He had built cottages with three rooms, believing that number to be indispensable to the preservation of female morality; but when the rooms were provided, there was a difficulty in getting the family to use them all; they still huddled together as they had done before. As regarded the education of the labourer, he considered it might be carried too far ("Oh!") The labourer might be injured almost as much by over-education as by being kept in a state of ignorance. One thing that would do much to raise the labourer was, the substitution of measure or task-work, for the payment of a uniform rate of wages (Hear, hear). The extent to which labouring men might be improved by having a sufficient stimulus had been illustrated in his own experience. He had a carpenter, with four men under him, who years ago was a common labourer. It was, he believed, by affording incentives to improvement that they would do most to elevate labourers.

Mr. JAMES SANDERSON (Westminster) regretted that much exaggeration was often indulged in, with regard to the condition of the agricultural labourer. For upwards of 25 years he had mingled daily with labourers in Scotland, and he had been struck with their general freedom from vice and immorality. He thought Mr. Burn was too sweeping in his condemnation of the bothy system, which had not generally been attended with bad results. The Scotch labourer had equally good accommodation with the English labourer, received higher wages, was a more skilful workman, and, in point of intelligence, was vastly his superior.

Mr. S. SIDNEY hoped that that question would be discussed every year, because it was one of those questions which Parliament could not reach, and which only could be effectually stirred through the action of public opinion. When a foreigner was visiting England, and he (Mr. Sidney) showed him the manufactories and the workshops of England, and the results of agriculture, he felt extremely proud; but when he took him into the cottage of an agricultural labourer, he felt very much ashamed (Cries of "Oh!"). Gentlemen may cry "Oh," but every one who had eyes to see, and ears to hear, would agree with him, that a large proportion of the agricultural labourers of this country were, in their food, their clothing, their intelligence, and in their social position, by no means what they ought to be. He blamed no man for this, but such was the real state of the case. It should be borne in mind that the peasant of the present day was the son of a man who lived in a still worse condition; and when they perceived how reluctant labourers were to avail themselves of schools and the other advantages offered them, they should recollect that the labourer was the child of tradition, and that early associations still cling to him. To show what was the condition of the labourer 40 or 50 years ago, he would read the following description from an unquestionable authority:—"The agricultural labourers of this country were practically slaves; their labour was put up by auction to the best bidder by the parish authorities. The report of the Board of Agriculture in 1816 says, 'The overseer calls a meeting on Saturday evening, when he puts up each labourer by name to auction, and they have been generally let at from 1s. to 1s. 6d. per week and their provisions, their families being supported by the parish.' The farmer doled out to the labourer head money, not according to his work, but his necessities—discharged his best workman, if with a small family, to take on the worst, with a large family. A crowd of idlers were paid, on pretence of working at the roads, while the independent labourer was marked as a fool for pretending to earn his bread by the sweat of his face." Parish functionaries—the squire, the parson, a farmer, and sometimes a paid overseer—were led away from the real object of their duty, the administration of relief to the indigent, into the belief that they were the great patrons of the whole labouring population, who could never go alone without their aid. The labourer with a manly bearing, struggling hard for independence, was considered insolent and contumacious; the whining, lazy hypocrite, dwelling in squalid misery, was sure of relief. Such was the condition of the labouring population of this country 44 years ago; and allowance should be made for it, in judging of their conduct at present. Thus much

was certain, that if they wished to improve the labourer, they must begin with his dwelling. Where this was insufficient for decency and health, it was not likely that education, or any kind of religious instruction, and other means, would produce the desired result. Again, while putting down beer-shops and fairs, farmers should endeavour to provide wholesome recreation and decent places of resort in the instead, otherwise farmers would deserve a character which they very much dreaded, that of mere radicals and destroyers (laughter). The labourer, like other men, required to be amused, and some provision must be made for that purpose. In some villages reading-rooms, with fire, and light, and books, and newspapers, had been provided; but they were generally spoiled by over-regulation. In some, smoking was forbidden; in others none but religious works of the most serious and often dull description were admitted; and in others, and worst of all, the patrons were continually intruding, making the poor people uncomfortable. He fully appreciated the invaluable services of the clergy in promoting education and encouraging philanthropic and mutual benefit associations; but parsons, from their high class education, often did not understand the labourer as well as the farmer does. He (Mr. Sidney) was much struck with the discussion on the condition of the labourer that had recently taken place at Warminster, reported in the "Journal of the Society of Arts." There it was stated that the book-hawkers, who are helping village schools, by carrying the means of education to the door of every cottage, sold chiefly religious books. If that was the case, they had not found their way to the real labourers. Farmers or squires would not fill up their bookshelves with religious books, or go to an hotel or a club where every movement was under regulation, and every book under a censorship. Then, again, as to education, farmers had not taken enough part in its direction; it had therefore been made too discursive—a smattering of everything, and the foundation of education taught very imperfectly. There was no reason to despair of the condition of the labourer; it had improved and was improving; but it was essential that farmers, instead of trying to burke discussion, and taking every statement of facts as a personal offence, should grapple with the question of cottage accommodation, and make landlords understand that lodgings for labourers were as essential to profitable cultivation as the farm-buildings on which capital was often so freely expended. Without cottages within an easy distance, or with overcrowded cottages, the farmer loses the labour wasted in walking to work, loses the strength exhausted in foul huts, and pays in parish rates for the immorality and the premature decrepitude produced by putting half-a-dozen of both sexes to sleep where there is only air and space for two or three. Labour was scarce, and likely to be scarcer. Farmers must make up in quality for want of quantity. They must have the rising generation well housed, usefully educated, and provided with temperance substitutes for the beer-house. As regarded Scotland, he must say that the gentleman who immediately preceded him spoke as if everything was right there, or, at any rate, that the evils were slight and much exaggerated (laughter). Against that opinion, however, must be set the fact that drunkenness and illegitimacy prevailed in Scotland to a fearful extent, and the only source to which the second of these evils could be traced were the abominable and disgusting arrangements of the labourers' dwellings (Hear, hear, hear). It could not be for want of education—Scotland was famous for the education of its working classes—nor for want of religious instruction; no nation was more observant of the ordinances of their religion. The marriage law was not, as in France, a difficulty; it was the easiest thing possible to be married, in Scotland. Illegitimacy was not encouraged by the poor laws; the poor laws of Scotland were merciful to a fallen woman. We were therefore compelled to trace the degrading fact to whisky drams, crowded cottages, and bothies, which were hovels often only fit for cattle of a coarse breed. Of course this assertion would be termed an exaggeration; but there was an evil attached to land attacked, but some one rose to call it an exaggeration because he could not deny it. Public opinion on the subject of cottage accommodation was in a very low state in Scotland; it was low

enough in practice, although not in theory, in many parts of England. To illustrate the low state of public opinion in Scotland on that subject, he might remark that not long since one of the most distinguished benefactors of Scotland, Mr. William Chambers, having built a model-cottage, a description of it was circulated throughout the country in order, he (Mr. Sidney) presumed, that other cottages of the same kind might be erected. That model cottage consisted of what? Why, of two rooms, with cupboard-bedssteads, in which the family were to be born, and laid out when dead.

Mr. E. TATTERSALL said, having read the letter in the *Times* of that day, he did not agree with Mr. Edmonds that it was an attack on farmers. If it were an attack, that evening's discussion was the best answer it could possibly receive, for it showed that in coming to the metropolis to exhibit their animals farmers had not forgotten those who assisted to improve them. (Cheers.) He was quite sensible that the labourers generally in the agricultural districts were not housed as they ought to be. But with whom did the blame rest? He certainly agreed with preceding speakers that it rested in the first instance with the landlords; but, then, it should be recollected that tenants were bound to use their influence to induce landlords to discharge their duty towards the labourer. (Hear, hear.) He concurred also in the opinion that good cottages might be erected for £70 a-piece, and he believed tenants would be willing to take to them, receiving only 4 or 5 per cent. for their money, in order to acquire a salutary control over their labourers. Although education was not to be lightly estimated, although the clergyman and the school-master might do much to improve the condition of the labourer, it must be recollected that education did not consist merely in reading and writing? (Hear, hear.) It commenced with the cradle; and if the first ten years of the child's life were spent amidst dirt, disorder, and indecency, it was scarcely possible that the character in after-life would be what they must all desire that it should be. The foundation of all virtue amongst agricultural servants was the possession of a decent home. With regard to France, he must say that what he had seen there showed him the disadvantages of the land being cut up into such small farms. He was convinced that a great many of the farmers in France were below the English labourer in education, talent, and everything that constituted the man, and this was one great reason why, in spite of all the arguments of radicals and others, we ought to rejoice that England still possessed a class of large landowners who had the power and the means of improving the condition of the labourer, who was best cared for on large well-managed estates.

Mr. T. F. WILSON (Allthorne, Essex) said, having had a good deal of Scotch labour, he had no hesitation in affirming that the Scotch labourer's education and his comparative freedom from the temptation to drink made him the superior of the English labourer. Education constituted the main difference. As the twig was bent the tree inclined, and it was education only that could provide farmers with honest, skilled, and intelligent labourers.

Mr. WALTON (Alton) concurred in the condemnation of the practice of paying good and bad labourers the same wages. Many of them must, he said, often have felt that one man was better worth 15s. than another was worth 6s., and yet both perhaps received the same amount.

Mr. BADDINGTON (Sutton Coldfield) contended that landlords could not fairly be expected to build cottages without the expectation of a reasonable return for their outlay.

Mr. W. COTTER (Middle Aston, Woodstock) did not believe the remedy for existing evils was to be found in any one thing; it was not to be found in education or in improved dwellings alone, but in a combination of causes tending to ameliorate the general condition of the labourer. One source of depression was the fact that labour was not free; it could not be free so long as the law of settlement continued in operation.

After a few words from Mr. W. BENNETT,

Mr. BURN replied,

On the motion of Mr. Skelton, seconded by Mr. J. Thomas, of Bletsoe, thanks were voted to Mr. Burn for his introduction; and a similar compliment having been paid to the Chairman, the meeting separated.

HIGHLAND BEEF AND MUTTON.

The highlands of Wales, Ireland, and the north have many characteristics partaking of a common identity relative to their cattle. The causes that produce such a similarity of results merit at all times a careful inquiry. The superior quality of beef and mutton which our highland herds and flocks yield is a topic that pre-eminently invites discussion about Christmas.

Between our hill-fed butcher-meat and the greasy stuff exhibited at our Christmas fat stock meetings and markets, there is a wide contrast in more respects than one, whether we examine the animals when alive, their carcasses after they are slaughtered, or their meat when it appears at table. In such examples, generally speaking, quality is greatly in favour of the former, but quantity as much in support of the latter.

When we begin, however, to examine individually hill-bred animals, or the quality of meat they yield, and the weight of the carcass compared with the quantity and quality of food consumed, a very wide diversity of results is then perceptible. Highland cattle, including oxen and sheep, are as far from being uniform in this respect as lowland ones, the returns yielded from equal quantities of food consumed being as greatly diversified in the one case as in the other. With these results, farmers in the highlands are not more familiar than are those of the lowlands.

From a physiological point of view it is very interesting to investigate such diversities of results in one's own flock or herd. We do our best to select bulls and cows, rams and ewes of as uniform a type as we can, and of the best quality of breeding stocks in the country. Farmers have done so from time immemorial. But when we begin to gather together the fruits of our labours for market, they require no little drafting before they will suit a purchaser. The offspring is thus not so uniform as the parent stock. Herds and shepherds are alive to this retrograde movement: hence the care with which they annually select those they intend to keep for a breeding stock, from those they intend to send to market.

We have only to examine the details of management of our hardy mountain breeds of oxen and sheep, in order to perceive the cause of this retrograde movement. No language can adequately convey to the minds of those not practically acquainted with the northern highlands a just conception of the hardships our hill-breeding stocks are often called upon to endure during the autumn, winter, and spring months. The herds and shepherds accustomed to attend them have not unfrequently some difficulty in giving credence to what they see. When viewed prospectively, what appeared as an absolute impossibility to-day, is retrospectively looked back upon from to-morrow with an eye of romance as it were, so inexplicable are the ways and means with which Nature adapts herself to her own peculiar exigencies in a highland storm.

The chief characteristics in the management of hill stock that claim attention have reference to the diversified nature of the produce of our highland pastures, the amount of exercise stock experience in gathering their food, the effects of the same upon muscular development, the severity of the climate, and the privations of winter. A very cursory

survey of these will suffice to show that the improvement of our mountain breeds of oxen and sheep is rather a broad concern, more so than is compatible with the forcing system now pursued in the management of our improved lowland stocks; while it will, at the same time, prove that there is no stock more susceptible of improvement than our highland herds and flocks.

The food consumed by our mountain stocks, when exclusively confined to the hills, is about as diversified in quality as can well be imagined. Both on the west coast and some parts of the east we have seen a highland ox knee-deep in the ocean amongst seaweed to-day, and half-way up to perpetual snow to-morrow, amongst heath and bent. When sent to the hills to shift for themselves, the variety of herbage is so great that some animals take to eating sea-wrack, heath, and such like, owing to a deranged state of the functions. Sheep are subject to an equally diversified dietary, deranged state of the system, and to similar habits and consequences generally. Another class of animals, again, may be seen always actively busy in search of the finer herbage, shunning the coarse, consumed by the preceding class, unless under the pinching extremes of necessity, when the former cannot be had.

It is the severity of the climate during the winter season, and the privations and hardships consequently experienced by young stock, together with the coarse herbage they are often compelled to consume, that deranges their digestive and alimentary functions, producing those constitutional changes of internal as well as external configurations so conspicuously manifested in herds and flocks. In the lowlands, with an abundance of aftermath, young clovers, &c., farmers are familiar with the difficulty experienced in preventing calves and lambs from getting "a set" immediately after they are weaned; but when hill-calves and lambs are left to shift for themselves amongst the bleak mountains of the north, it is not surprising that they should lose the symmetry of their parents—becoming stunted, unsightly starvelings before the return of another grass season. It would rather be an exception to ordinary rule were the contrary experienced.

Although the grass season is short in the highland glens of the north, yet vegetation is rapid, yielding in many places a rich luxuriant bite to stock. It is very remarkable how fast animals will fatten upon it—like black cattle, sheep, and deer. We have some experience in the fattening of our improved breeds on the best grazing grounds of the lowlands, but we have never seen animals lay on fat so fast as in some of our best highland glens during the grass season; while the quality of the meat they yield for table (beef, mutton, and venison) maintains a still higher degree of superiority.

In results of this kind there is nothing but what is easily accounted for, when the facts of the case are duly taken into consideration, as all the means are present necessary for their production. During the short period in question, for example, heat, light, and moisture are abundant, while the narrow strips of land upon which the best herbage grows are rich and well adapted for its luxurious vegetation under such conditions. The rich and finely-flavoured beef, mut-

ton, and venison, about which Highland chiefs boast so loudly, are the natural productions of the fine herbage of his short but busy season.

We have said *busy season*, and so it is, much industrious agility being manifested by stock of every kind in the selection of their food. An animal, before it collects its breakfast, goes over a goodly length of journey; so that when we take into consideration the unlevel nature of the ground, no little muscular energy is daily spent in feeding. The exercise thus daily taken by highland stock is favourable to muscular development and quality of meat, and accounts for the larger amount of lean meat which their carcases present when they come to the shambles. There is not only a better development of muscle, but the quality of the tissue is finer, while the fat is equally superior, and mixed better with the lean. All these results are thus produced by natural causes. In one sentence, we have the exhibition of a superior article—a higher degree of organism than is exemplified in our improved breeds of the lowlands.

Those of the young stock, whose functions have not been seriously impaired by the previous autumn, winter, and spring, recover very fast when they get the length of their second year's grass, and hence become better able to stand the second winter. Unfortunately, however, as already stated, a large number of animals, oxen and sheep, do not so recover, but are led by instinct in search of medicinal plants; and even to eat seawrack, and drink salt water. A few of these may recover during the third grazing, and so on, thus satisfactorily accounting for all the diversities to be met with amongst stock in the highlands, and the beef and mutton they yield when sent to market.

It will thus be seen that the means of improving the breed of our highland stock, or, perhaps we should say, the means of preventing their deterioration, is a more uniform system of diet, and shelter from the inclemency of the weather. In this there is nothing novel, for it is just what every intelligent farmer has been striving to reduce to practice for the last half-century, to the best of his ability. Since ever we knew anything about highland farming (and that is now nearly forty years) farmers have endeavoured by every means in their power to prevent their calves and lambs getting "a set" after weaning, by removing them to the best lowland winter grazings, turnip feeding, &c.; while not a little has been done in many cases by drainage and shelter to improve hill-pasture, and thus make better provision for the wants of flocks and herds in spring, when they are returned to their native grazings, and in autumn, before they are removed from them, to the winter keep of the lowlands.

But with all the advances that have thus been made of late, much remains to be done before highland stock receive even a shadow of fair play, when placed in comparison with the improved breeds of the lowlands, or even before their own merits as breeds can be fairly tested or estimated in a pecuniary or money-making sense.

In estimating the merits of our mountain breeds of cattle and sheep, too little credit is generally given to the superiority of the meat they yield for our tables on the one hand, and, on the other hand, to the small quantity of produce that supports them in their native pastures for the manufacture of this superior quality.

In the management of our improved Shorthorns and Southdowns, we contrive, by artificial means, to give them the benefit of a perpetual summer season as it were, well aware that unless they enjoy a uniform supply of rich food, from the time they are weaned up to the

period when they are sent to the shambles, the upshot will be a losing game, besides an inferior quality of butcher-meat, always estimated at a higher price than it is intrinsically worth. Attention has already been drawn to the rapidity with which our hill-breeds fatten in their native glens during the short season of vegetation. Now, were it possible to give them a perpetual summer amongst their own mountain glades and Alpine terraces, or even an approximation to what their lowland rivals enjoy, what results would they then return? Were they thus treated, and the proper attention paid to the selection of animals for breeding, it must appear evident to all who have any experience in their management that they would return much higher comparative results.

In advocating fair play for our Highland stocks, it must not be overlooked that southern stock-farmers are rapidly advancing in the march of progress—at least so far as weight of carcase and early maturity are concerned. Had the former only to contend in the market with the old stocks of the Lowlands, the day would be their own in a pecuniary sense of view; but when they are placed in the scales with our improved breeds, as Shorthorns, Southdowns, &c., it then becomes a matter of justice to examine practically the details on both sides before we can arrive at a satisfactory conclusion.

Comparing the beef and mutton of our highland stock with the beef and mutton of our Shorthorns, Southdowns, and other improved breeds that attain to early maturity and heavy weight, quality, we have seen, is greatly in favour of the former; but the other conditions just mentioned (*viz.*, weight and early maturity) are in favour of the latter. Now, as the superior quality of meat is a condition that cannot be given up consistently with sound practice, two questions naturally arise for solution, *viz.*, Can we improve the weight and early maturity of our highland breeds without deteriorating the quality of the meat? and, Can we improve the quality of the beef of our improved Shorthorns, Herefords, and Devons, and the mutton of our improved Southdowns, Leicesters, Cotswolds, &c., without losing weight and early maturity? And to both these an affirmative answer must unquestionably be given.

Of late a very popular plan for the solution of both these problems has been extensively and most successfully pursued by many, *viz.*, a cross between highland and lowland breeds. As a permanent system, however, it is surrounded with many drawbacks, for the beef and mutton of such crosses are inferior in quality to the beef and mutton of the pure highland stock, while second-crossing cannot be successfully pursued, so that the parental stock must be kept pure on both sides. Such being the facts of the case in practice, we have consequently to fall back upon the problem of improving both parental stocks; for so long as they are capable of improvement, results from first-crossing can never be considered a settled and permanent question. So long as we can increase the weight of our highland breeds of cattle and sheep, and get them to market sooner, without deteriorating the quality of the meat they yield, and so long as we can improve the quality of the beef and mutton of our improved lowland breeds of stock without interfering injuriously with their early maturity and weight, the sound practical and philosophical course is to go on improving until the two extremes meet in one common equality of early maturity, weight, and quality of meat. Looking at the stalls of our butchers at this season, the reader may no doubt safely say we are far from the standard of equality as yet; but that is no reason for saying that two bodies moving towards each other will never meet.

DHU-ALBINACH.

NOTES ON NOVELTIES AT THE IMPLEMENT DEPARTMENT OF THE SMITHFIELD SHOW.

As the merry Christmas month brings with it its winter carnival week for agriculturists, and opens in the Show-yards at Baker-street its ranges of pens filled with plethoric cattle for astonished and somewhat bewildered Cockneys to gaze at; so brings it the usual crush and crowd of its implement galleries, through which we have to wend our way, with what patience may be granted us, to pick up and jot down the peculiarities of such novelties as may be likely to interest our readers. This annual task of ours—or rather, say we, this pleasant gossip—is certainly not lightened by the material difficulties which have to be encountered in the miserably confined space in which the implements and machines to be examined are thrust. We have said examined: such is the word which we suppose, in accordance with the dignity of the subject, we ought to use; but the notion is indeed a pleasant fiction, that either time or space is allowed for examination. So far from either of these being obtained in the full plenitude required, the truth is, that to such a pitch has the matter of accommodation arrived, that “space” for the purpose of exhibition means no longer “ground” or “floor,” but “air” space, as well; for, not content with cramping up with exceeding ingenuity the smallest possible amount of floor space with the largest possible amount of machines, these, like Mahomet’s coffin, are suspended in mid-air; so that, while of some you obtain a bird’s-eye view and look down upon, of others you have what we suppose we should call a “worm view,” and look up at them. But not only above and below, but “in and out and round about”—to quote for the nonce from Coleridge’s “Ancient Mariner”—machines and implements are confusedly crowded. The result is, that it requires no small exercise of ingenuity to dig out, so to speak, anything new from the heap of stuff surrounding it, and no small amount of patience to ascertain from its inventor some points connected with it; for, such is the surging sea of “humans” dashing up against you, that attempts at conversation are, to say the least, interjectionary, and consequently confusing. We very frequently and very feelingly experienced that we were “members of the press;” and we are in justice bound to say, that its “freedom” was uncommonly well displayed.

To proceed, however, with the purposes of our paper, we propose to glance at the leading novelties of the Implement Galleries, commencing with the machines and implements connected with the culture of the soil. In this department steam cultural mechanism takes precedence of all others.

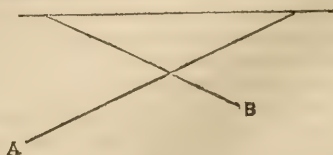
The chief novelty exhibited was Mr. Grafton’s modification of Halkett’s Guideway Steam Agricultural Apparatus. We gave in this journal a very full and detailed account of Halkett’s system, the main feature of which, as our readers may perhaps remember, was the employment of a series of permanent rails laid

parallel to each other on the land to be cultivated; a long frame-work being moved along the rails by steam-power, contained in the frame; the implements of culture being connected with the frame-work. These permanent rails involved a large sum in their first putting down, as well as a certain outlay to keep them in repair. Mr. Grafton—by his mechanism, a model of which was exhibited at the show—proposes to get rid of the expense of permanent rails, by dispensing with them altogether, and at the same time to ensure all the advantages of Halkett’s system, these undoubtedly and chiefly being the precision of its movements and the facility with which a variety of operations could be carried on at the same time.

The framework employed by Mr. Grafton resembles in its construction and arrangement that carried out by Mr. Halkett: it is of iron, and consists of a series of girders supported by and framed to the side trussed girders. These side girders carry a series of small diameter wheels, twenty-two in number—eleven on each side. The enclosure within the side girders affords space for the engine and boiler, water, and fuel receptacle.

The peripheries of the supporting wheels are broad, and are supplied with air-tubes or India-rubber cushions. These, encased in a strong vulcanized India-rubber case, give by the weight of the superincumbent mass of framework and machinery a flat surface of equal pressure on the shoes of the “endless rail” over which they pass. This endless rail is formed of a continued belt of very strong fabric, composed of India-rubber and flax threads, to which is connected a series of wooden “shoes” shod with iron. These are fastened to the endless belt by staples across the centres of the shoes and at right angles to the belt. This arrangement permits the belt to pass round the drums—two of which are placed at each end of the framework in advance of the series of driving and supporting wheels.

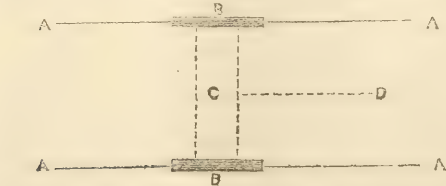
The material of which the endless belt and the peripheries of the driving wheels are made may be thought not very durable. The inventor, however, states that its durability is very great, and mentions an instance where the tires of a brougham formed of India-rubber tubing ran 2,000 miles at an average rate of eight miles an hour. Whereas, in the case of the steam cultivating apparatus, the wheels will make only twenty revolutions per minute, and travel moreover on a smooth, at least soft, surface, so that the wear-and-tear may be reduced to a minimum.



The ploughs or other cultivating implements are sus-

pended from the under-side of the frame, and are so arranged that, while one set (a) are in action, the other (b) are out of the ground.

As the turning of so large a piece of mechanism—fifty feet in width—on the field is not contemplated, special arrangements are made, to shift it from the "bout" of land which it has finished ploughing, to the next part not yet operated upon. At the headlands rails are laid down (a a); on these trucks, represented by the darker lines (b b), are made to traverse. The large



steam cultivating frame is received on the floor (c) of these trucks, and moved along by winch



power in the direction of d. The field arrangement will be thus: Let a a a a represent the rails laid at the headlands; the lines b c, e d, the track of the side-supporting wheels of the framework, which is supposed to be traversing in the direction from b to e; the space between the lines b c, d e being ploughed or otherwise cultivated. On reaching the headland a a, the framework is passed on to the beam trucks traversing the rails (a a), and is worked along till it reaches a point, so that, while one set of wheels work in the old track (d e), the other shall work in a new track (f g), fifty feet distant from d e. The cultivator is thus passed from the beam truck to the ground, and made to traverse by steam power in the direction f g, ploughing or cultivating the space between the lines d e, f g. On reaching the lower headland, the cultivator is passed on to the truck beams, and moved laterally till the wheels shall run in the new track (h i) and the old one (f g), traversing in the direction h to i, and ploughing or cultivating the space between the lines f g, h i. In this

manner the whole field is cultivated, with the exception of the headland spaces (a a, a a), which the inventor proposes should be grass, and fenced off from the part under cultivation. The field will be cultivated in strips fifty feet wide; while the wheels, running always in the same track, will form these, as the lines b c, d e, f g, and h i, into hard, well-beaten, smooth tracks, over the surface of which the endless rail will be made to traverse, with little loss from friction. The engines are fitted with reversing gear, and can be disconnected from the platform, so as to be available for other farm work. "The engines," says the inventor, "like those of the Great Eastern steamship, are not in any way connected; and there is no occasion for them to be so, as both sides of the cultivator progress at the same rate, even if the engines be of different power. No motion takes place on one side of the cultivator without being communicated to the other side, through the framework, the bracings and great strength of the girders and general trussing precluding any contrary action. Even if one series of wheels have to pass over any slight elevations or undulations, and so to traverse a greater length of land than the others, the velocity or revolutions of such wheels will increase accordingly; but both sides of the framework will still progress at the same rate, and continue an onward course, without deviating from the straight line."

The value of the following statements, furnished by the inventor, will best be understood by the reader without any comments of our own:

ANNUAL EXPENSES OF FARM OF 1,000 ACRES, CULTIVATED BY STEAM POWER UNDER GRAFTON'S SYSTEM.

	£	s.	d.
Expenses and depreciation of endless rail, locomotive, and implements, costing £1,500, at 15 per cent. ..	225	0	0
Coal, at 20s. per day—250 days ..	250	0	0
Oil, &c... ..	10	0	0
Engine driver, at 4s. per day; and two attendants, at 2s. per day each ..	124	16	0
Five constant labourers ..	155	0	0
Labourers for hand operations ..	50	0	0
	£814	16	0

ANNUAL EXPENSES OF A FARM OF 1,000 ACRES, CULTIVATED BY HORSE POWER UNDER THE PRESENT SYSTEM, ON CLAY LAND.

For a Farm of 200 acres: Capital (eight horses, four ploughs, harrows, horse-hoes, scarifiers, two waggons, rollers, four carts), £500.

	£	s.	d.
Depreciation of stock, at 15 per cent. ..	75	0	0
Horse keep—corn, 100 qrs.; hay, 30 tons ..	244	0	0

Labour—			
Four carters, 12s. per week ..	£124	16	0
One horse keeper extra ..	31	4	0
Three labourers ..	105	6	0

100 acres corn-hoeing, at 4s. ..	20	0	0
Cutting 50 acres of corn, at 8s. ..	20	0	0

	621	6	0
Multiply by 5, for 1,000 acres :			5

	£3,106	10	0
Deduct 15 per cent. on £200—the saving in machinery on a large farm over the smaller..	30	0	0
	£3,076	10	0

This sum shows the farmer's annual field expenses for ordinary field cultivation on the fourth or fifth shift system, exclusive of all extra labour for harvest, &c., but including all that can be done by machinery in the field.

In our next paper we shall glance at the other novelties in the implement galleries.

R. S. B.

THE OLD NORFOLK FARMER AT THE SMITHFIELD CLUB SHOW.

SIR,—Whatever might be the case with the cattle—and I find that the opinion I ventured to express upon them is, to a great extent, supported by those practical men with whom I have conversed on the subject—there was no falling off in the quality of the sheep and pigs, although, from one cause or another, the number of either exhibited was smaller than in previous years; in fact some of the largest and most successful exhibitors have ceased to be represented on this occasion, which has caused a considerable *hiatus* or blank in the show. There was, however, enough of these smaller animals to excite the attention and admiration of the vast crowds that day after day were admitted to the yards.

The long-woolled races of sheep were most of them well represented. The Leicesters and the half-bred Leicester and Downs, I thought equal to any that have ever been exhibited; and the weight that some of them as shearlings had attained was enormous. This was the case with Mr. Twitchell's beautiful Leicesters, as well as those of Col. Lowther, Earl Berners, and some others, which would have made Bakewell's heart leap for joy. Mr. John Overman's half-bred Down and Leicesters, too, were remarkably fine sheep, and fully sustained the reputation the family has so long enjoyed as the exhibitors of this cross breed, as well as of the pure Southdown. These sheep displayed their high breeding, and I could not but admire how much the quality of both the wool and the flesh of the Leicesters and their crosses are improved, although the latter will never equal the pure Downs in fineness of grain and richness of flavour. Still, under present circumstances of the high price of butcher's meat, it is desirable to promote the extension of the long-woolled and half-bred sheep, as they certainly produce a larger amount of meat in a given time than other breeds, although more of the Downs can be kept upon an equal number of acres. The crosses of the Cotswolds are, I think, also a great improvement upon the original race, which appear to me to be rather a coarse one; and their tendency to gather fat is quite equal to that of the old Lincolnshire sheep, which in some respects they resemble. The few of this breed that were exhibited were very fine specimens, and it is scarcely possible to say which was the best of the various lots. Mr. Cradock's ewe of that breed was certainly a wonderful animal in point of size and proportions, but in other respects I think several others were quite as meritorious. The amount of human food a flock of Cotswold sheep would yield at twenty months or two years old must be enormous, if the specimens at the show are any criterion; and, as I have before said, that is a good reason for the race obtaining patronage from the managers of our public exhibitions whilst meat continues at so high a price, which does not appear likely to be reduced while the population continues to increase, and the great hives of industry in the north are so fully employed.

Notwithstanding the absence of the representatives of three of our old exhibitors of Southdown sheep, there was no falling off in the excellence of those of that race which were in the yard. The late Duke of Richmond's stock were certainly an ornament to the show, but those of Mr. Rigden, Lord Walsingham, Mr. H. Wilson, Mr. J. Overman, and others, made amends for their absence. These beautiful animals, with their small delicate heads set on so spiritedly, their close and fine wool, their square and well-proportioned carcasses, and their short and slender legs, shew them to be the true aristocrats of the fold. But their flesh—there lies the excellence of the breed. I think the poet must have had a leg of Southdown mutton in his mind's eye when he penned his admirable lines (to a gourmand at least):

"Gently stir and blow the fire:
Lay the mutton down to roast:
Dress it quickly, I desire:
In the dripping put a toast,
That I hunger may remove,
For mutton is the meat I love.

"On the dresser see it lie:
O, the charming white and red!
Finer meat ne'er met my eye:
On the sweetest grass it fed:
Let the jack go swiftly round:
Let me have it nice and browned.

"On the table lay a cloth:
Let the knives be sharp and clean:
Pickles get, and salads, both—
Let them both be fresh and green:
With small beer, good ale, and wine,
O, ye gods, how I shall dine!"

These lines, I say, must certainly refer to either Southdown mutton or to the old Norfolk, to which latter there is no modern mutton worthy to be compared. The last taste I had of that breed was at Newmarket, some forty or fifty years ago. They were well adapted to the heaths of that district, but not at all to the modern system of farming; for they would leap a fence five feet high as easily as a greyhound, and no hurdles could confine them when hungry. And then their size and horns! a Norfolk ram of four or five years old was almost as tall as a donkey, and with his spiral horns he would attack the stoutest shepherd's dog as fearlessly as a lion. Peace to their ashes! they were, like their countrymen (setting self-praise aside), a spirited race, and 'tis a pity they have become extinct; but fashion is everything.

Asking pardon for dilating thus upon what was not exhibited, I return to "*nos moutons*." The Hampshire and west country Downs were few in number, but excellent in quality. Mr. Canning's pen of the latter were particularly handsome; and so were those of Mr. Stephen King, and those of his namesake W. King, both which obtained the prizes with Mr. Canning. The size of these animals hardly accords with my ideas of the feed on the Downs; but I suppose, in this respect,

the race is improved by high feeding and crossing. It has, until recently, been a mystery to me how these and other sheep come to have their fleeces so perfectly even, and their forms so square; but I now find that they are clipped into shape some time previous to the shows, and thus are apt to deceive an examiner as innocent as myself of the tricks of the trade, until you come to feel their ribs and flanks, when the looseness of the flesh explains the deception. This is not quite fair to the judges, who, whenever it is detected, ought to put a mark upon those pens in the catalogue the opposite of "highly commended." I have heard of ladies with a "crick" in the back concealing it from their lovers before marriage, to the horror and disgust of the latter after it; and this clipping into shape of the competing sheep is something upon a par with that practice, and ought not to be encouraged, as it places the fair exhibitor of really good unsophisticated stock at a disadvantage.

But the swinish multitude! Ah! everything here was fair and aboveboard—if the age announced is correct. I have never heard of anyone shearing his hogs, excepting a "certain gentleman in black," who is said on the occasion to have obtained "great cry and but little wool!" Well, I have said, if the ages stated on the cards are correct—for certainly it is almost impossible to believe that any animals could attain the size of some of those exhibited in the time specified—if all is true, they have made the best of their time in laying on fat. I understood that the judges were greatly puzzled to choose amongst the porcine charmers those entitled to the prizes, and were obliged to call in some "skilled workmen" to assist them. His Royal Highness the Prince Consort shone, as he usually does, in this department, and exhibited some perfect specimens of the Middlesex breed, only four months old. By-the-bye, I have no recollection of a breed of Middlesex pigs as a race distinct from others. The metropolitan county, in fact, is too *cosmopolitan* to claim a native race of either men or animals, being made up of emigrants from all other parts. Be this as it may, nothing could exceed the perfection of these "pigs royal." Some of the black and white Berkshires were uncommonly precocious, and staggered one's faith sorely in respect of age. How fashions alter! There was a time when the best pigs exhibited in the days of the old "Board of Agriculture" were rejected solely on the ground of having "black bottoms!" But that was in the days of the Georges, when everything looked black, and people naturally took a distaste of the colour. Mr. Crisp's black breed were, as usual, first-rate; and so were his white ones. A lucky man is Mr. Crisp; for I understand one of his sows has brought him in eight or nine hundred pounds by the selling of the progeny, and the prizes he has obtained. Some of the pigs in Class 42 were the most extraordinary I ever saw for their age. Mr. Beale's improved Leicesters (17 months 11 days old), Mr. Tomb's Sherborne and Berkshires (16 months), and Mr. W. W. Champion's (14 months 27 days) were all wonderful. The latter were said by the keeper to weigh 40 score—of course this must be

dead-weight. But Mr. Beale's, it was asserted, weighed the same, dead-weight. These latter had been blind with fat three months. Several other lots were remarkable for their precocity; but I should suspect that, in cooking, a large proportion of the fat would dissolve, and go into the grease-pot. This depends, however, upon the food with which they are fattened. Indian-corn, for instance, will fatten them faster than any other food; but the fat is not solid. This is the reason that American pork wastes so much in boiling: the pigs there are all fed on maize. I once fattened three hundred pigs myself with that grain; but the pork, though very excellent in other respects, was objected to by those who purchased it, on the above account.

Some of the extra stock of pigs were equally good with those in classes. Mr. M'Naughton's four-year-old-off Sussex hog was a wonderful fellow, with flesh as firm as that of an ox. The prize hog also (Mr. Tomb's) had a carcase as deep as an ox; but he would not, or could not, get upon his legs, to let me see his proportions in other respects. When politely requested to rise, with a gentle poke in his ribs, he uttered a cry something like that of a sloth, eschewing all locomotion. I could, however, see his legs and head—which former accounted for his unwillingness to receive his visitors standing; for so small were they, that it must have been painful in the extreme to have got up. No gouty alderman could labour under greater inconvenience in this respect.

But I must hasten to the machinery department, and even there confine myself to a few of the most notable and novel articles. I was, in fact, completely bewildered, as well by the multitude of the machines and implements exhibited, as by the mob of people to look at them, which positively prevented me from making any examination of many of the machines. Messrs. Burgess and Key have improved their combined mower and reaper by the addition of a lever, by which, if an obstacle lies in the way of the cutting-bar, it can be instantly raised so as to clear it. Messrs. Hornsby and Co. have improved their plough by a lever-neck, for elevating or depressing the share, or moving it more to the land if necessary. Mr. Halkett's guideway steam-cultivator was exhibited by Mr. Weare, to whom he has transferred the patent. But Mr. Grafton, his late engineer, exhibited what he considers an improvement upon Halkett's system, and which, if it can be carried out, will obviate the only objection against it—namely, the expense of the rails. This plan is to make the working machine carry its own railway, by attaching to the eight wheels, on each side, an endless band of vulcanized India-rubber, to which are attached pieces of board about two feet long, on which the wheels will run. A share, or scraper, goes before the wheels, to clear away any obstructions; and it is presumed by the projector that the wheels will instinctively keep on the straight line, without deviation, if once set off on the right track. This is the only point to be ascertained, and which can only be so by experiment upon a large or practical scale. Should it succeed, it will certainly

reduce the labour of a farm to a mere bagatelle compared with what animal-power now costs.

Messrs. Child and Owen had a churn of novel construction. It consists of a plain barrel, without any beaters on the inside. It is hung, by gudgeons fixed on its centre, on a strong frame, and is perfectly air-tight. An air-pump is fixed on the top; and when the milk or cream is put into the cask, air is pumped into it as long as the pump will work. The aperture is then closed, and the cask is turned backwards and forwards by a winch fixed to the gudgeon. In ten or eleven minutes the butter is "come"; and it is said to be of superior quality, and more in quantity, than that obtained by the common churn. Mr. Child has also improved his smutter by the addition of a draught-pipe (or chimney) on each side, to catch and convey away the dust from the wheat. This obviates an inconvenience which the machine laboured under, in dispersing the dust about the place in which it was worked. This machine is now getting extensively into use by millers and corn-merchants.

Messrs. Clayton and Shuttleworth exhibited an excellent brick-making machine, which turns out 25,000 bricks, of the best quality and make, per day. Mrs. Wedlake's successors had a new chaff-cutter, on an improved principle. The price is only £4, and it does as much work with the same power as a large machine.

But my letter is getting to very large dimensions, and I must bring it to a conclusion. This year's "Show" has been most successful, so far as the increasing interest manifested by the public in general; and it bodes well for agriculture when all classes, and professions, and callings in society thus consider it worth devoting their time to an examination of its attractions. I trust the time will never arrive when the Exhibition of the Smithfield Club will have lost its patronage from any class, either by a change of its locality, or inattention to its efficiency on the part of its conductors.

Yours, &c.,

AN OLD NORFOLK FARMER.

London, Dec. 18.

PRINCIPLES OF MANURING.

THE ROTHAMSTED EXPERIMENTS WITH SPECIAL MANURES DESCRIBED.—THE COMPETENCE OF ARTIFICIAL MANURES, ALONE, TO PROCURE SUSTAINED AND REMUNERATIVE FERTILITY IN ROTATION-CROPPING PROVED EXPERIMENTALLY.—THE CATTLE CROPS SHOWN TO EXHAUST THE LAND MORE THAN THE CORN CROPS.

There probably is no industrial expedient whose economic policy has presented itself in so many different aspects, as that of green crop husbandry. When, at its first introduction into this country (now about two centuries ago), it merely consisted in the appropriation of a small part of the then universal quadrennial bare-fallow to turnip growing, its office was deemed well-fulfilled, if roots were raised sufficient to prevent the ravages of disease and death from hunger amongst the live stock of the farm during winter; and whose only sustenance aforetime, during this inclement season of the year, had been the miserable herbage of the neighbouring common, supplemented by a scant and innutritious modicum of corn-straw. In the end of the 17th century and beginning of the next, the device then came to subserve a double duty, for now roots had attained so important a position on the farm as to supply not only abundant winter keep to the lean stock and milch cows (for at this time winter fattening was unknown), but to form a considerable source of direct money-profit through sales to the grazier, whose difficulties with his beasts and sheep during the dead months of the year were scarcely less than those of the tillage-farmer. Meanwhile the culture of clover had likewise gained a considerable footing; and in process of time both hay and turnips so glutted the market which had sprung up for these products as jointly with the great trouble and expense of transporting such bulky commodities, soon gave rise to another phase in the economy of this newly-emerged branch of husbandry. This consisted in the corn-farmer

now employing the abundant keep thus thrown on his hands in prosecuting an extended and improved system of lean-stock management conjointly with the more hereditary and staple industry of corn-farming. At this period the relative available proportions in which the forage and cereal crops occupied the area of the farm were altogether arbitrary; but, ere long, the enlightened and enterprising agriculturists of the eastern counties of England gave to the world that symmetrical and cyclic method of which the Norfolk four-course rotation was the aboriginal type; and henceforward roots and clover not only obtained an equal dominion with corn in the tillage fields, but were now made the basis of an entirely new branch of husbandry—namely, the winter-fattening of beasts under cover and of sheep by folding on the turnip field. At first there was thought to be direct substantive profit derivable from this expedient: but the conviction at last became universal, that, except in so far as the device was abundantly productive of farm-yard manure, it possessed no economic value; and hence this unsatisfactory fluctuation of opinion respecting the true industrial office of the intercalation of green crops with corn, has finally settled down on the admission, that but for its manurial results, such as these are, it cannot be deemed of any real advantage. Coincident with these progressive changes of creed respecting cattle-crop and cattle-husbandry, a belief had been springing up that the intervention of roots and clover between successive corn crops, originally resorted to on mere economical grounds, was in reality a physio-

logical necessity, to prevent the land from lapsing into sterility and the produce into degeneration. Nevertheless, within the last twenty or thirty years this supposed infallible basis of catholic rotation husbandry has signally falsified its own pretensions, by itself introducing wide-spread morbidity in the very plants whose alternate culture with corn was deemed indispensable to undegenerate cereal vegetation; and at the present moment the best tillage-husbandmen are those who have most emancipated themselves from the trammels of this traditional empiricism, and who most entertain the conviction, that if as good and cheap manure could extraneously be procured, as what is yielded by the indigenous source of the cattle court, it is not necessary longer to combine cattle and corn husbandry together, simply because it was once deemed advantageous, on now effete manurial considerations, to do so.

But although it thus is probably true that few of the better class of modern farmers would shrink from entering on new paths of practice, did there exist any clear lights to guide them in a new course, a large amount of experiment and tentative practice has yet to be performed before any fresh system can be substituted for that which is passing away. That various commercial substances, natural or factitious in their origin, applied alone, ensure a single good crop, or even may exhibit a certain amount of continuous fertility, is doubted by none; but whether any procurable extraneous manurial is competent to maintain a farm in full bearing from one course of rotation to another, without any aid from the accustomed cattle-court supply, constitutes a problem which has never yet been industrially solved. Other collateral questions besides this one could readily be propounded, but to it we shall restrict ourselves at present, because upon it the experiments selected for examination in the following columns are especially instructive. They are reported in the third branch of that experimental Essay by Messrs. Lawes and Gilbert, published in vol. xviii. of the *Roy. Ag. Soc. Jour.* (1857), and which contains also the report of the barley experiments already commented on in prior numbers of this magazine.

In point of general design, the trials now to be narrated consisted in subjecting six plots of land forming part of a close in the Rothamsted home-farm, called Agdell-field, each to a separate but parallel and contemporaneous course of four years' rotation, thrice repeated between the years 1849 and 1857 inclusive. The species of crops grown were the same in each, namely, turnips, barley, clover (but on the clover failing in the second course, beans or bare fallow in its place), and wheat. Divided into groups of two each, one pair of the plots received *no manure* of any kind, either at the beginning or during the progress of the experiments. In another

pair, the turnips of each course were dressed with *superphosphate of lime alone*; the third pair being treated in like manner, but with *mixed alkalies, ammoniacal salts, and rape-cake, in addition to superphosphate*. Between the individuals of the several pairs there was this important difference of management, that in one—throughout all the three courses—the turnips were carted off the land; in the other, they were consumed by sheep on the spot.

1. Of the two unmanured plots.

The following table shows the results of the experiments in this pair. Unfortunately the returns of only the turnip and barley crops were reported by the experimentalists.

TABLE I., showing the results of experiments in the UNMANURED

		PLOTS.			
A.—Plot from which the turnips were carted off.		Turnips, bulb and leaf.	Barley (dressed corn).	Clover.	Wheat.
Courses.		Tons.	B. P.	B. P.	B. P.
1st. Seasons 1849-1852..		9½	45 0½	?	?
2nd. " 1853-1855..		5	33 1	?	?
3rd. " 1857-1860..		1¾	46 0½	?	?
Means....		4½	41 2		
B.—Plot on which the turnips were fed on the land.					
Courses.					
1st. Seasons 1849-1852..		9½	46 2	?	?
2nd. " 1853-1855..		5	32 1½	?	?
3rd. " 1857-1860..		1¾	44 1	?	?
Means....		4½	41 0½		

Here, then, in the rapidly-decreasing produce shown in the turnip column, is presented an instance of the rapidity with which land not well adapted for turnips (for such is the character assigned by the experimentalists to the Rothamsted soil) suffers depletion of the normal supply of nutriment required by that voracious plant in its cultivated state—a circumstance contrasting very strikingly with the steadiness with which the barley maintained a fair yield throughout all the three courses. Supplied by no adventitious fertilizing aid, the roots degenerated from bulbs of ordinary size to those no bigger than a radish, whilst the barley crops in each alternate year exhibited a very abundant yield.

2. Of the two plots in which each course was manured with *superphosphate of lime alone*, applied quadrennially with the turnips,

TABLE III.
Comparative Abstract of the Unmanured Plots and of those manured with Superphosphate of Lime.

	Where the Turnips were carted off.		Where the Turnips were fed on the Land.	
	Turnips.	Barley.	Turnips.	Barley.
Mean of the unmanured plots.—Table I.	Tons.	B. P.	Tons.	B. P.
" superphosphated plots.—Table II.	4½	41 2	4	40 0½
	13½	30 2	13½	43 3
Increase of the manured turnips	9½	..	9½	
Decrease of the superphosphated barley where the turnips were carted off		11 0		
Increase of the superphosphated barley where the turnips were consumed on the spot				2 2½

TABLE II.

A.—Plot from which the turnips were carted off.		Turnips, bulb and leaf.	Barley (dressed corn).	Clover.	Wheat.
Courses.		Tons.	B. P.	B. P.	B. P.
1st. Seasons 1840-1852..		16½	28 3	?	?
2nd. " 1853-1856..		18½	31 3½	?	?
3rd. " 1857-1860..		10½	30 3	?	?
Means....		18½	30 2		
B.—Plot in which the turnips were fed on the ground.					
Courses.					
1st. Seasons 1840-1852..		16½	41 3½	?	?
2nd. " 1853-1856..		18½	38 3½	?	?
3rd. " 1857-1860..		10½	50 2½	?	?
Means....		18½	43 3		

The comparative table (No. III) is pregnant with matter deserving of very careful consideration; and, first, we remark that amongst that class of landlords and tenants who may be termed Conservative Rotationists, no creed in husbandry is more implicitly believed, than that as a field crop the turnip is to be regarded not only as

guilty of no tendency to deteriorate the soil by any undue drafts on the nutritive elements of the land, but that in every respect a turnip crop leaves the staple in a bettered condition for the plentiful growth of the succeeding members of the course. Here it is impossible, without transgressing reasonable limits, to trace the origin and rise of this fallacious belief: suffice it to say, firstly, that those evidences usually cited by the orthodox upholder of rotative practice in support of this theory are really due to the immensely improved methods of working the land which contemporaneously have sprung up with the spread of alternate husbandry; secondly, *that, in point of fact, there is more than double the amount of vegetative nutriment withdrawn from the soil by an average yield of cattle crops than by an ordinary produce of corn*; and, thirdly, a very convincing instance will be cited from the experiments under consideration, of the injury to the succeeding barley, actually caused by the excessive voracity of the turnip as a plant of field culture. In support of these three propositions, it would be inconvenient at present to enter on any argument. In evidence of the second, the following analytical table is appealed to:

TABLE IV.

Showing, by the Analysis of the ordinary crops of a Four-course Rotation, that a produce of Turnips and Clover of average amount withdraws more vegetative nutriment from the soil than is withdrawn by the two corn crops of the course.

						CHEMICAL CONSTITUENTS IN			
						17½ Tons of Turnips (bulb and leaf).	40 Bushels of Barley (grain and straw).	3 Tons of Clover Hay and After- math.	32 Bushels of Wheat (grain and straw).
						lbs.	lbs.	lbs.	lbs.
Inorganic matters in the crops.	Silica	..	..	..	..	33	124	15	133
	Potash and soda	..	..	..	..	157	19	87	48
	Lime and magnesia	..	..	..	..	80	25	216	21
	Oxide of iron	..	..	..	..	7	1	4	1
	Chlorine	..	..	..	..	27	2	12	—
	Phosphoric acid	..	..	..	..	43	27	29	21
	Sulphuric	..	..	..	..	50	3	19	5
	Carbonic	..	..	..	..	31	—	78	—
						428			
						201	201		
Inorganic matter in excess in turnips com- pared with barley }						227			
Inorganic matter in excess in turnips com- pared with wheat }						226	.....	460 234	234
Inorganic matter in excess in cattle crops compared with corn crops .. }						453			
Organic matters in the crops.								Turnips and Clover.	Barley and Wheat.
								3637	3876
								5376	4835
								9013	
								8711.....	8711
Organic matter in excess in cattle crops compared with corn crops .. }								302	
								35135	835
								879	498
Water }								36014	1533

Now, here it shall be taken for granted (and those farmers whose books are best kept will be the readiest to endorse the assumption) that, substantively, cattle-crops and cattle-feeding form together an unprofitable branch of modern farming, and that conjointly they cannot even inferentially be deemed a remunerative industry, except as a means by which home-made farm manure is manufactured, for the benefit of what alone forms the real source of profit to the tillage farm, namely, the grain or other marketable crops. From this undeniable postulate it follows, then, that the true office of the cattle crops is one of mere subservience to the cereal industry of the farm. But in the business of manuring, as usually practised, their relative positions are actually reversed. In other words, instead of giving to either of the primary members of rotation—the barley and wheat—the first fruits of the periodically administered contents of the cattle-court, they are wholly lavished on the roots, although these possess no rational claim to such exclusive liberality. And observe the consequences of the existing routine, of which this ill-judged proceeding forms a part: before the barley is grown the roots have already abstracted twice as much nutriment from the land as a moderate crop of barley consumes (see columns 1 and 2 of Table IV.); and then, again, before wheat takes its turn in the quadrennial round, the clover has forestalled this the most remunerative product which the tillage farmer can grow (see columns 3 and 4 of the same table), in the same exorbitant proportion. This is a subject which, did space allow of it, might be argued upon various additional grounds demonstrative of the physiological impolicy of the present manurial basis of alternate husbandry; but that one, on which we shall here expatiate, consists in the palpable demonstration of the exhaustive effects of turnips on the soil afforded by the Rothamsted experiments now under consideration.

Thus, on turning first to Table I. already given, of the particulars of the *unmanured* trials, it is there seen that the relative mean acreable products of the turnips and barley, where the former were *carted off*, were

Turnips.	Barley.
Tons.	B. P.
4½	41 2

And in Table II., where the results of the trial with *superphosphate of lime* were given, the collateral yields were 13½
Inferior yield of barley consequent on the greater prior yield of turnips 11 0

Here, then, the state of the evidence is this, that where the *unmanured* land grew only 4½ tons of turnips to the acre, and these were *carted off*, the yield of barley in the subsequent year was 41½ bushels; and that where, *stimulated by the use of superphosphate of lime*, the soil yielded 13½ tons of roots, and these also removed from the ground, the barley produce of the succeeding season was less than that of the *absolutely unmanured* land by 11 bushels of corn per acre.

Putting, then, these experiments side by side with the evidence afforded by the Chemical Table No. IV., we apprehend that no husbandman whom inveterate

habits of thought and practice have not placed beyond the pale of reformatory reasoning, will be able to withstand the conviction, that the real cormorants amongst the four ordinary rotation crops are roots and clover.

3. Of the two plots on which each experimental course was manured with *superphosphate of lime, mixed alkalies, ammoniacal salts, and rapecake*, applied quadrennially with the turnips.

It has already been noticed, that the produce of clover and wheat in the several rotations has not been reported by the experimentalists; and we will, in the following table, which, as respect the turnips and barley, is an exact summary of the authors' own tabulations, supply, *conjecturally*, the unreported details.

TABLE V.

Showing the produce- (clover and wheat, conjectural) of the plots manured with superphosphate of lime, mixed alkalies, ammoniacal salts, and rape cake.

A.—Plot from which the turnips were carted off:	Turnips (Bulb & Leaf.)	Barley (Dressed Corn.)	Clover ?	Wheat ?
	Tons.	Bush. P.	Tons.	Bush. P.
1st course 1849—52	21	32 3¼	3	28 0
2nd course 1853—56	20	38 0¼	3	28 0
3rd course 1857—60	19	47 3¼	3	28 0
Means . . .	20	39 2¼	3	28 0
B.—Plot in which the turnips were consumed on the ground:	Turnips (Bulb & Leaf.)	Barley (Dressed Corn.)	Clover ?	Wheat ?
	Tons.	Bush. P.	Tons.	Bush. P.
1st course 1849—52	21	42 3¼	3	32 0
2nd course 1853—56	20	36 1	3	32 0
3rd course 1857—60	19	64 3¼	3	32 0
Means . . .	20	48 0	3	32 0

The manurial substances used in this experiment were as follows:

TABLE VI.

	Quantity in Lbs.	Cost. £. s. d.
Superphosphate of lime	350*	0 19 0
Sulphate of potash	300*	2 0 0
" of soda	200*	0 10 0
" of magnesia	100*	0 4 6
" of ammonia	100+	0 13 6
Muriate of ammonia	100+	1 3 9
Rapecake	2000+	4 1 0
		£9 11 9

* These are the proportions in which the substances were used in the experiment of barley grown in successive years. See after table xi.

+ These are the proportions actually reported.

Now, assuming here, what presently will be proved to be true, that a much more advantageous use of manure produced from the cattle crops could be made, than applying it to the tillage land, we would remark that the common conviction amongst the best farming calculators, although little direct statistical evidence has ever been adduced on the point, is, that after crediting the cost of cultivating and handling the two cattle crops of rotation with the sale proceeds of the live stock, there remains a balance of loss which, charged to the manure produced in the process of feeding, makes the

expense of manufacturing this bulky and ponderous commodity, and applying it to the land, not less than 7s. 6d. per ton. Thus, then, a manuring with farmyard dung, at the medium rate of 15 tons per acre, costs £5 12s. 6d. The cost of extraneous manures used in the Rothamsted experiment, at the rate in point of quantity assumed above, was shown to be (Table VI.) £9 11s. 9d. Excess in cost of the extraneous manures £3 19s. 3d.

But when the intrinsic merits of the two are taken into consideration, the following very striking facts present themselves: 1st. That of the 15 tons of the indigenous manure upwards of 9 tons consists of absolutely innutritious *water*; and upwards of other $3\frac{1}{2}$ tons of organic constituents, which, except in their contained nitrogen, are, in thoroughly improved soils, of little or no value. This leaves no more than $2\frac{1}{2}$ tons of available mineral composition. And from whence have these $2\frac{1}{2}$ tons been obtained? Are they when deposited to be deemed a fresh acquisition received by the soil? Certainly not, since it is beyond all question that *they form in reality but a small portion* (the major part sent to market in corn and fatted stock) of the identical ingredients abstracted from the land, by the roots, clover, and straw, whose remains form the contents of the dung-court. As such, therefore, the use of homestead manure can no more sustain a farm in heart, than any one can keep a good balance at his bank credit who habitually pays in less than he draws out; while he who makes liberal use of extraneous fertilizers, may be likened to the thriving customer whose drafts are counterpoised by equivalent deposits. In laying out £5 12s. 6d. in growing cattle crops, and converting them into 15 tons of homestead manure applied to the land from which it was obtained, the farmer who does so is making restitution of a mere fractional part of what that land had itself yielded; and since it is but too true, that coincident with this unreciprocal and exhaustive system, two at least of the four members of rotation husbandry have been running an unprosperous course of progressive disease and degeneracy, can any question, therefore, be more worthy of the attention alike of landlord, agent, and tenant, than these?—whether, on the one hand, it is or is not an agricultural fact, that a farm could be kept in full and permanent bearing by means of adequate periodical supplies of extraneous manures? and, on the other hand, whether, also, it could or could not be so, without derogation from what hitherto has been the profitable returns of tillage husbandry?

In proceeding next to argue these two points of enquiry, we will reverse their order, and first take up the financial query, and present the following table, with no further preface than this, that its figures are the exponents of a very considerable amount of carefully collected and digested statistical information.

TABLE VII.

Showing the Acreable Expenses of Working a Turnip Soil under a Four-course Rotation of mixed Corn and Cattle Crop Husbandry; Capital invested £10 per acre. Rent 32s. per acre; including Tithes, Rates, &c.

Expenses of producing the turnips and clover, converting them into manure, and carting and applying it to the ground, as before stated £5 12 6

Note.—This is to be held as including every expense connected with the cattle crops and cattle (including a proportion of rent, &c.), after deduction of the yearly returns from the fatted animals sent to market.

Expenses of cultivating and handling the barley crop, including a proportion of the general

charges connected with the cleaning of the land 4 11 9
Expenses in like manner connected with the tillage of the wheat crop 4 14 1

Acreable yearly mean £3 14 6

RETURNS.

Average market price of 40 bush. of barley, at 3s. 6d. per bush. equal to £7, and straw charged against manure, $1\frac{1}{2}$ ton at 20s. .. £8 10 0
Average market price of 28 bush. of wheat, at 6s. 6d. per bush, equal to £9 2s., and straw, $1\frac{1}{2}$ ton, at 20s. 10 12 0

Acreable yearly mean.. 4 15 0

Average acreable nett profit, being at the rate of 10 per cent. on the capital invested (£10 per acre), viz., ... } 1 0 6
On cattle and cattle crops £2,704
On corn crops 1,296
£4,000 }

The next table will give a monetary view of a supposed management analogous to the Rothamsted rotation experiment, and based on the assumption that, as in that tentative instance, a full manuring of superphosphate of lime, alkalies, ammoniacal salts, and rapecake is used, and the root crop carted off. The computations will assume, also, that a market could be obtained for the roots, hay, and straw, and that by the withdrawal of cattle from the management, the capital required would be reduced to £6 per acre.

TABLE VIII.

Expenses of tilling and handling the turnips, including rent, &c., and a proportion of the general expenses of cleaning, the land but *exclusive* of manuring £3 2 6
Expenses connected with the clover crop 3 1 0
Expenses connected with the barley crop as before (Table VII.) 4 11 9
Expenses connected with the wheat crop as before (Table VII.) 4 14 1

Mean annual expense of tillage .. 3 17 4
Quadrennial expense of extraneous manures, as computed before (Table VI.) £9 11s. 9d. equal yearly to 2 7 11

Acreable yearly mean of expenses .. 6 5 3

RETURNS.

1. Green Crops and Straw.

Value of 15 tons of turnips, exclusive of leaf, at 3s. 4d. per ton .. £2 10 0
Value of clover-hay, $1\frac{1}{2}$ ton, at 53s. 4d., equal to £4; $1\frac{1}{2}$ ton of aftermath, at 39s., equal to £2 9s. 6 9 0
Value of $1\frac{1}{2}$ ton of barley straw, at 16s. 8d. per ton 1 5 0
Value of $1\frac{1}{2}$ ton of wheat straw, at 16s. 8d. per ton 1 5 0
11 9 0

2. Corn.

Average market price of 40 bush. of barley, at 3s. 6d. per bush. .. 7 0 0
Average market price of 28 bush. of barley, at 6s. 6d. per bush. .. 9 2 0

Average yearly mean of returns 6 17 3

Nett acreable profit, being at the rate of 10 per cent. on the capital invested, now reduced by the withdrawal of the cattle from the management to £6 per acre 0 12 0

In Table VIII. we have purposely computed the value of the turnips, clover, and straw crops at a rate which brings out an acreable profit to the farmer of the same per-centage amount of the capital employed as in the prior computation (Table VII.); the result being this—that after laying out £2 7s. 11d. per acre yearly on artificial fertilizers, the farmer could afford to sell his root crop at 3s. 4d. per ton, his hay at £2 13s. 4d. per ton, and his straw at 16s. 8d.; these prices being, in fact, far below the ordinary selling price of the several articles.

But since this hypothetical case assumes the use of extraneous manures only, to the exclusion of those manufactured at home by the conversion of roots and hay into farm dung, it behoves us to suggest some conceivable outlet for these cattle crops, through which they could be converted into money at prices approximating those adopted in the calculations of the table last given. Well, then, pursuing for a moment longer the same ideal mode of preliminary illustration, let it be supposed that a given farmer, practising alternate husbandry, has for his next neighbour an enterprising grazier, who, impressed with the prevalent conviction that live stock is destined long to maintain a steady rise in price in the butcher market, and that, checked by foreign importations, no equal buoyancy can be predicted of corn, is desirous to extend his business without enlarging his farm, which, from various conceivable circumstances, might be inconvenient or impracticable. Now, would such a party be unwilling to relieve the corn-farmer of his cattle crops and straw at the respective values set on them in Table VIII.? Would not the forecast of such a man suggest to him not merely the benefits of an extended business in a commodity pre-eminent for its rising market value, but the enriching influence on his meadows and pastures which the ample top-dressings of dung converted by his stock from the imported provender would enable him to apply? How easy to him, and how innocuous to the land, would be the carting and laying on of this bulky and ponderous material on the firm turf of his pastures, compared with the toil and injurious poaching of the fallow field implicated in its use in tillage farming! On his fields this manurial administration would possess all the characteristics of a fresh importation of fertilizing matter. Applied to the arable field from whence it was produced, it possesses no true contributive quality whatsoever. Of course this scheme, considered in its merely literal acceptation, is impracticable; because in the corn-growing districts—where only supplies of roots, hay, and straw could be furnished, there no grazing neighbours exists ready and willing to receive them. And now our argument assuredly merges into strictly practical reasoning when next we demand to know what impediment there is to each tillage farmer engrafting the prosperous industry of grass-land management on his holding. How can a man get rich quickest by farming? was asked of a great agricultural authority in the days of the Roman emperors. "By being a good grazier," was the reply. How next? "By being a middling grazier." How next? "By being a bad grazier." All the world contributed its supplies of breadstuffs to the Italy of that

day; and her own corn husbandry was depressed by the competition. But supplies of fatted animal food, whether in the live ox or sheep, or in their slaughtered carcasses, could not be imported from afar. So it is of England in the present day. Poland, the South of Russia, Egypt, the back settlements of North America send us plenty of corn, but not an ounce of fresh butcher-meat. In this department of cosmopolitan husbandry the English farmer enjoys a virtual monopoly in his own country, and, that, too, in the midst of a population rapidly increasing, both in the number of mouths and in pecuniary ability amongst the great mass of the working classes to gratify the universal preference for liberal animal diet.

Do we profess to have conclusively affirmed by these arguments the preliminary issue placed at the head of this section of our statement, viz., "Is it certain that farms, generally, could be cultivated with artificial manures without derogation from the rate of profit ordinarily obtained from the existing modes of tillage husbandry?" We answer, No. But not in vain have we written, if, in this commentary on the Rothamsted investigation into the action of artificial fertilizers in rotation culture, has been raised a clear conception and probability that, *provided* tillage farms could be kept in full bearing by means of extraneous manuring alone, the sources of agricultural profit would thereby be largely augmented.

And now the other question, formerly stated, presents itself for argument: Could our arable fields be maintained in unflagging productiveness without the aid of home-made manure, and with the aid of extraneous manures only? In point of conclusive demonstration this remains to be determined, and can only be conclusively determined by husbandmen themselves, through the means of tentative industrial practice. Nevertheless, we trust to be able to exhibit the strongest possible presumptive evidence in support of the proposition.

In the first place, then, it is seen from the preceding table No. V., that the use of mixed inorganic substances—phosphatic, carbonaceous, alkaline, and nitrogenous—amounting to 1,150lbs., in conjunction with 2,000 lbs. of rape-cake, maintained the two experimental plots to which they were applied in such abundant bearing during the three courses, that in the one plot the produce of barley in the third course exceeded that of the first by the astonishing amount of 15 bushels per acre, and in the other by the still more wonderful increase of all but 22 bushels.

The next evidence which shall be adduced, to show that extraneous manures are competent to maintain soils in undecaying fertility, is to be found in the reports of the well-known Killerton case, published in the "Bath and West of England Agricultural Journal," and already noticed in a prior No. of this series of articles. It was—or rather is, for the experiment is still in progress—an instance of strictly alternate husbandry, comprising the simple rotation of roots and corn. In point of quality, the land experimented on is an excellent turnip and barley soil. The by-past period of the trial has embraced five seasons—namely, from 1855 to 1859 inclusive. Till 1850, the land had been out on lease, and poorly treated, and at this period was put under a single course of turnips (moderately manured with guano), barley, clover, and wheat, *all three unmanured*. Then commenced the experimental treatment about to be described, and in which the absolute abnegation of farmyard dung has been persevered in, conjointly with the non-consumption of any part of the produce by live stock on the spot, and with the use of artificial manures only. In the five left-hand columns of the subjoined table, the yearly quantities of manure applied are stated; in the right-hand one, the average annual produce is particularized.

TABLE IX.

Showing the Manures employed, and the Produce obtained, in the Killerton Experiment of Alternate Husbandry, conducted with Artificial Fertilizers only, by T. D. Acland, Esq.

Seasons.	Crops.	Yearly Quantity of each Manure, in Pounds.					Average Yearly Produce per Acre.
		Alkalies.	Superphosphate of Lime.	Sulphate of Ammonia.	Nitrate of Soda.	Guano.	
1855...	Swede turnips.....	187	224	168	—	—	Tons. 13½
1856...	Buff wheat	112	224	224	224	168	B. P. 32 0½
1857...	Swede turnips.....	—	224	224	224	224	Tons. 9
1858...	Barley	—	—	224	224	224	B. P. 55 0
1859...	Mangolds	—	280	224	224	224	Tons. 20½
	Yearly quinquennial means of manures per acre.....	60	190	213	179	168	

It is impossible for any one who runs his eye down the column of yearly produce not to be convinced that Mr. Acland's system of extraneous manuring has kept the experimental plots in full health.

These Rothamsted and Killerton cases are the only recorded instances in which the effects of extraneous

manuring have been exemplified in *rotation cropping*. But the following Rothamsted experiments in *successive corn-growing*, where artificials only were used, are still more demonstrative of the ability of these to impart a very large degree of sustained fertility to the soil :

TABLE X.

Showing various Experimental Instances of Successive Wheat-growing—1st, with No Manure; 2nd, with Farmyard Dung extraneously obtained; and 3rd, with Artificial Manures only, of the kind enumerated in a former Table, extracted from Messrs. Lawes and Gilbert's paper on "Agricultural Chemistry" (*Royal Agricultural Society's Journal*, vol. xii., 1851).

Year.	Dressed Corn: Produce per Acre of Plots of the same Field.			[A.—PLOTS 3, 2, AND 18A OF THE EXPERIMENTAL SERIES.]	Means.		
	Plot unmanured.	Plot manured with 14 tons of F.-Y. Dung.	Plot manured with Artificials.		Unmanured Plot.	Plot manured with Farmyard Dung.	Plot manured with Artificials.
	B. P.	B. P.	B. P.		B. P.	B. P.	B. P.
1844..	16 0	22 0	22 3¼	} Means of 1st part of the seven years ..	18 2¾	27 2	29 1½
1845..	23 0¾	32 0¾	33 0¾				
1846..	17 3¾	27 0¾	31 0				
1847..	16 3¾	29 3¾	32 0¾	} Means of 2nd part of the seven years ..	16 2½	28 2¼	29 3¾
1848..	14 3	25 2¾	26 3				
1849..	19 1	30 3	32 1½				
1850..	15 3¼	28 2¾	29 3				
Totals	123 3¼	196 1¼	207 3¾	Means of entire period of seven years...	17 2¾	28 0¼	29 2¾
				[B.—PLOTS 3, 2, AND 18B.]			
1844..	16 0	22 0	22 3¼	} Means of 1st part of the seven years ..	18 2¾	27 2	26 0¾
1845..	23 0¾	32 0¾	33 0¾				
1846..	17 3¾	27 0¾	21 1				
1847..	16 3¾	29 3¾	29 1½	} Means of 2nd part of the seven years ..	16 2½	28 2¼	29 2¼
1848..	14 3	25 2¾	26 2¾				
1849..	19 1	30 3	33 2¼				
1850..	15 3¼	28 2¾	28 2¾				
Totals	123 3¼	196 1¼	195 1½	Means of entire period of seven years...	17 2¾	28 0¼	27 3½
				[C.—PLOTS 3, 2, AND 17A.]			
1844..	16 0	22 0	20 2¼	} Means of 1st part of the seven years ..	18 2¾	27 2	28 3¼
1845..	23 0¾	32 0¾	32 0¾				
1846..	17 3¾	27 0¾	30 2				
1847..	16 3¾	29 3¾	35 1¾	} Means of 2nd part of the seven years ..	16 2½	28 2¼	31 1
1848..	14 3	25 2¾	28 3¾				
1849..	19 1	30 3	33 1½				
1850..	15 3¼	28 2¾	29 2¼				
Totals	123 3¼	196 1¼	210 2	Means of entire period of seven years...	17 2¾	28 0¼	30 0¼

ABSTRACT OF PRODUCE BY ARTIFICIAL MANURES.

Mean produce of Series A	..	..	..	..	..	29 2¾
" " B	..	..	..	..	..	27 3¾
" " C	..	..	..	..	..	30 0¾
						29 1

TABLE XI.

Showing the Results of similar Experiments in Successive Barley Growing, taken from Messrs. Lawes and Gilbert's Article on the Growth of Barley by Different Manures (*Royal Agricultural Society's Journal*, vol. xviii., 1857).

Years.	Produce of Dressed Corn per Acre.						Means.				
	Plot 1	Plot 3	Plot 14	Plot 17	Plot 20		Plot 1	Plot 3	Plot 14	Plot 17	Plot 20
	Unmanured.	Manured with 14 Tons of Farm-yard Dung.	Manured with 2,000lbs. of Rapecake.	Manured with the same Substances as in Table VI., except the Rapecake omitted, and the Ammonia Salts doubled.	Manured with the same Substances, both in kind and quantity, as in Table VI.		Unmanured.	Manured with 14 Tons of Farm-yard Dung.	Manured with 2,000 lbs. of Rapecake.	Manured with the same Substances as in Table VI., except the Rapecake omitted, and the Ammonia Salts doubled.	Manured with the same Substances, both in kind and quantity, as in Table VI.
1852..	B. P.	B. P.	B. P.	B. P.	B. P.	} Mean of the 1st part of the six years	B. P.	B. P.	B. P.	B. P.	B. P.
1853..	27 3 $\frac{1}{2}$	33 0	39 0 $\frac{3}{4}$	45 0 $\frac{3}{4}$	38 0		29 3	41 3	46 2	50 3	46 0
1854..	26 0 $\frac{1}{4}$	36 0 $\frac{3}{4}$	39 3 $\frac{1}{4}$	44 2	40 0 $\frac{1}{4}$						
1855..	35 0 $\frac{3}{4}$	56 1 $\frac{1}{2}$	60 3	62 3	60 1	} Mean of the 2nd part of the six years	29 3	44 2	49 3	50 3	49 3
1856..	33 1 $\frac{1}{2}$	50 0	48 2	49 2 $\frac{3}{4}$	51 3						
1857..	14 1 $\frac{1}{4}$	32 0	36 3 $\frac{1}{4}$	37 2 $\frac{1}{2}$	35 1 $\frac{1}{2}$		25 3	44 2	49 3	50 3	49 3
	29 1 $\frac{1}{4}$	51 1	64 0 $\frac{1}{4}$	64 3 $\frac{1}{4}$	62 1						
Totals.	166 1 $\frac{1}{4}$	259 1	289 1	304 2 $\frac{1}{4}$	287 3 $\frac{1}{4}$	Means of the entire period of six years.					
							27 3	43 0 $\frac{1}{4}$	48 0 $\frac{3}{4}$	50 3	48 0

Looking at the results of Tables X. and XI., it is seen from the former that for seven consecutive years a yearly acreable average of wheat was grown with artificial manures alone at the rate of 29 1

And from the latter, that for six successive years a yearly acreable average of barley was returned at the rate of 48 0

Hence, then, in this is presented the remarkable circumstance, that, taking four years at a time into computation, the yield within this period was as great as if within a single course of a four-field rotation under ordinary husbandry, the land had per acre produced 58 bush. 1 $\frac{1}{2}$ peck of wheat, and 96 bush. of barley. Moreover, it is beyond measure important to observe, that in all these experimental instances the rate of yield was progressively increasing: thus—

Average produce of wheat, plots 18A, 18B, and 17A, Table X., 1st part of seven years per acre	B. P.
Ditto ditto 2nd part ditto ditto	28 0 $\frac{1}{2}$ 30 1

Yearly increase at the end of seven years per acre 2 0 $\frac{1}{2}$

Average produce of barley, plots 14, 17, 20, Table XI., 1st part of six years, per acre	B. P.
Ditto 2nd part ditto	47 3 50 0 $\frac{1}{4}$

Yearly increase at the end of six years, per acre.. 2 1 $\frac{1}{4}$

Again, comparing the productive effects of artificial manures with those of farm-yard dung obtained and applied extraneously, they stand as follows:—

Average yearly produce of wheat per acre grown in seven successive years with artificial manure (see abstract, end of Table X.)	B. P.
Ditto ditto with 14 tons of farm-yard dung yearly (see Table X.)	29 1 28 0 $\frac{1}{4}$

Yearly superiority of produce by artificials.. 1 0 $\frac{3}{4}$

Average yearly produce of barley per acre in six successive years with artificial manures (see Table XI.)	48 3 $\frac{3}{4}$
Ditto ditto with 14 tons of farm-yard dung yearly	43 0 $\frac{1}{4}$

Yearly superiority of produce by artificials.. 5 3 $\frac{1}{2}$

It would, indeed, be extraordinary if English husbandmen could much longer withstand the pressure of such facts as these. The time cannot be far off when the existing problems respecting both the cultural and economic value of commercial manures will receive systematic and practical determination at the hands of farmers themselves.

THE HORSE IN ARABIA.—The horse is involved in the most ancient superstitions of the people of Arabia. They believe him to be endowed with a nature superior, not in degree only, but in kind, to that of other animals, and to have been framed by the Almighty with a special regard to the convenience of man, and the setting forth of his person. It is one of their old proverbs, that, after man, the most eminent creature is the horse; the best employment is that of rearing it; the most delightful posture is that of sitting on its back: and the most meritorious of domestic actions is that of feeding it. Mahomet himself did not disdain to inculcate a lesson of kindness towards the horse. "As many grains of barley," said he, "as are contained in the food we give to a horse, so many indulgences do we daily gain by giving it." The belief is widely spread that the best breeds are descended from five favourite mares of the prophet, on which he and his friends fled from Mecca to Medina.—*Cassell's Popular Natural History*.

ENGLISH PLOUGHS AND PLOUGHING.

BY AN AMERICAN.

Many of our readers may remember seeing or exchanging conversation with the Hon. H. F. French, an American gentleman, who visited this country some three years since, and delivered at the meeting of the Suffolk Agricultural Association, held at Ipswich, in 1857, a lively and amusing speech. The hon. gentleman—and it may be observed, *en passant*, that every one holding responsible office in the United States, as Mr. French does, is an “honourable”—has since published, in deliberate black and white, the conclusions at which his English tour induced him to arrive in regard to English ploughs and ploughing, or, as he has it, English “plows” and “plowing.” Mr. French commences by comparing the weight of Ransome and Sims’ seed-plough for two horses, with that of implements designed for the same work at Boston, (U.S.). “Messrs. Ransome’s plough” (he proceeds to observe) “weighs 280 lbs., and its length is 12 feet; the average weight of American ploughs is about 200 lbs., and their average length about 7½ feet. The English implement is entirely of iron, of fine workmanship and finish, with two wheels, and is much less simple in its structure than the American; yet the American plough seems to be more firm and strong than the other. Indeed, the extreme length of the handles and beam of the English plough, notwithstanding that they are of iron, gives to the hand accustomed to the American implement a feeling of insecurity, as if the material were elastic, and would not be stiff enough to control the work were a stump or fast rock to be encountered in the furrow. This apprehension, however, is idle in most English fields, which for 1,000 years, perhaps, have felt the pressure of the ploughshare. But the difference between English and American ploughing is fully as striking as that between the ploughs. The worst ploughed field which I saw in a summer’s ramble through Old England might be said, literally to appearance, to be done better than the best-ploughed field that can be found in a New England farm. There seems to be no such thing in England as a crooked or irregular furrow; but however extensive the field, the work appears uniformly as straight as a line could be laid down by a civil-engineer with his instruments; and whether the operation be really more thoroughly performed than with us or not, it has at least the merit of being accomplished precisely as the ploughman desires. Our first impression upon these observations would naturally be, that notwithstanding the English plough is more clumsy and expensive than the American, yet the former must have advantages of structure, which for use in old and thoroughly-tilled fields, at least more than compensate for these objections. Yet this however natural, would be a hasty conclusion. Within 20 miles of Ipswich, where Ransome’s highly-finished ploughs are manufactured, in a week which was spent on a farm, and among intelligent farmers, in the county of Suffolk, an entirely different plough was generally in use—an implement so ungainly, so large, and so ill-fashioned, that it seems as if it must have been disinterred with the stone coffins of the Norman knights, which occasionally turn up in that neighbourhood, or have been found in the antediluvian deposits of coprolites, for which Suffolk county is famous. The plough referred to is that which is usually known in English books as the Norfolk plough, the peculiarities of which are, that it

has but one handle, and that its beam, running upwards at an angle of about 45 degrees from the level surface of the ground rests upon a framework supported by an axle, upon which are two wheels of about the size of the small wheels of a Yankee waggon. Those which I saw were of such style and finish as common mechanics on a farm would be likely to give to their productions. They certainly had no claim to the beauty of simplicity, or to the higher beauty of scientific adaptation to the purpose of their creation; yet the work done with this implement, so rude and so ancient, seemed in the skillful hands of English ploughmen to be just as straight and even as that performed by the polished, modern, and more artistic product of Ransome’s shops. And thus we have the mystery of English superiority in ploughing solved by the superior skill of English ploughmen, without necessarily admitting the superiority of English ploughs. A ploughman in England is a ploughman always. Destined to that position from his birth, if not long before predestinated to it, embarrassed by no hopes or aspirations for a higher station in life, he takes hold of the plough-handle in his early youth, and practises in a more equable climate almost every day of every month in every year of his life to perfect himself in this one operation. Trials of skill, in which small pecuniary rewards or the praise of his employer are accorded to the winner for the best performance in the ploughing match, are not unfrequent; and so by the division of labour incident to large farms, and by a manual dexterity and accuracy, which only long practice can give, the English ploughman, with the implement, whatever its form, to which he is accustomed, produces, on the particular farm to which he is attached as a labourer, a result which challenges the admiration of all. The question, however, between the English and American ploughs of modern construction is still open. Does the weight or the length, or does any other peculiarity of the English plough upon the whole contribute to the utility of the implement? It may be said that differences in the soil or the condition of the surface render any such inquiry fruitless to us Americans, because a plough that may be suitable and best for old fields in England may be quite unfit for the newly cleared fields of the New World. Such manifestly is the fact, but much of this New World has already been converted into broad clear fields, and much of our best alluvial and prairie land becomes by a few years’ culture as free from obstructions as the oldest fields of Europe. And again, as has been stated, the English plough, of whatever form, is of far greater weight than any American plough, and should therefore, other things being equal, possess proportionably greater strength, and so be suited for heavier work. Had we found the American plough the heavier of the two, it would have been at least a plausible explanation, that our new lands require a heavier and stronger implement than those of a country already thoroughly subdued. The very great diversity of structure of the various ploughs in use in England itself has not failed to attract the attention of scientific agriculturists as well as of plough manufacturers in England, for it is manifest that the difference in the structure of the ploughs in use in the different sections of that country cannot be accounted for upon the idea that the difference in soil and

crops require the use of implements so diverse, especially when it is known that throughout the varying climate and soil of Scotland there is but one form of plough in use, or rather it should be said, there is in Scotland, in the ploughs in use, no variation in principle, and but little in detail. In England, on the contrary, with no greater variation of climate or soil, there are in use, almost side by side, ploughs varying from each other in structure as much as any of them are distinguished from those in general use in the United States. Although at various times ardent advocates for progress have announced that the plough was soon to be superseded by some implement that shall stir the ground by forking or digging, propelled either by steam or beasts as may be convenient, yet it is probable that an implement which for 2,000 years, and probably much longer, has retained its position as the first and most important agent in preparing the soil for the seed, will remain in use long and extensively enough to warrant a careful study of its structure and mode of operation. It is proposed, therefore, to examine some experiments that have been recently made in England, with a view to ascertain the effect of the weight and different structure of the plough upon its draught. It is a fact well-known to practical farmers that the draught of different ploughs turning the same width and depth of furrow in the same field, and performing the work in substantially the same manner, varies so much as to be plainly perceptible in its effect upon the team. The use of the dynamometer, by which the power exerted upon the plough—or, in a word, the draught—can be actually measured, has confirmed and made definite this point, which before rested upon conjecture or mere estimate. It has thus been ascertained by a trial of ten different ploughs, each of a different make from the others, that the difference in draught in performing precisely the same work amounted to forty-five per cent. The experiment was made in turning a furrow with each plough, 6 inches in width by 5 in depth, in five different kinds of soil, and noting carefully the results as shown by the dynamometer. Taking the average of the five trials, it appears that while the plough of lightest weight required a power of 301lbs. to work it, the plough of heaviest draught required a power of 441lbs. to perform precisely the same work, and the other eight required the greatest possible variety of power between these extremes. Surely, differences so great as these, in the labour expended in the use of the most common and indispensable implement known to farmers, call for the most careful examination of causes, and the fullest exposition of principles and results. The writer is not aware that any very reliable experiments have ever been instituted to test by the dynamometer the comparative draught of English and American ploughs. A statement of such an experiment at the world's exhibition in London, in 1851, is found in the Transactions of the New York Agricultural Society for that year; but neither the depth nor width of the furrow is given, and the draught is so great—if we are correct in supposing the words "points of resistance" to mean "pounds of resistance"—as clearly to indicate that the trials were not well conducted. The attention of the plough-makers has generally been turned to the form of the mould-board, perhaps more than any other point, in their attempts to construct ploughs of easy draught. This is doubtless an important consideration, as well with respect to light draught as to good work; but the system of experiments under consideration seems to indicate that far less depends upon the exact form of the mould-board, as to the draught, than has generally been supposed, and that the weight of the imple-

ment itself, and the resistance to the coulter in cutting the furrow-slice, affect the draught far more. And the same experiments furnish results which will probably be surprising to all who have not witnessed or read of similar trials, as to the effect upon the draught, of the use of wheels upon ploughs, either under the beam or sole-plate, as to the effect of the depth of the furrow, and as to the influence of velocity on the draught. For the sake of system and convenience of reference, the results of such well-conducted experiments as have come to my knowledge, with such suggestions as have occurred to me, or been gathered from reliable sources, will be given under the following arrangement: 1. The influence of the weight of the plough on its draught. 2. The relative influence of the mould-board or turning process, and of the share and coulter, or cutting process, upon the draught. 3. The influence of the depth of the furrow upon the draught. 4. The influence of velocity upon the draught. 5. The influence of wheels of various kinds on the draught, and their utility. 6. The effect of the length of the various parts, as to the beam, the mould-board, and the handles, upon the operation of the plough."

We proceed with Mr. French's opinions on "Plowing" as he has it. Mr. French begins by considering the influence of the weight of a plough on its draught. We are perhaps accustomed (he says), to regard the weight of a plough rather as affecting the convenient and easy handling of it to the ploughman, than as of much importance to the labour of the team. We readily perceive that it is far easier to take from the tool-room, to place in the cart, to take out again and place upon the land an implement of 100lbs. weight than of twice that weight. All who have held the plough know practically how much more convenient a light plough is than a heavy one in setting in and throwing out at the end of the land; and especially does a farmer upon a rough farm appreciate this difference, where as indeed on many New England fields the plough is thrown or lifted out and set in at almost every rod of its progress, to avoid stumps or stones or roots of some almost imperishable tree felled perhaps half a century ago. Few, however, will be prepared for the results which have been developed by the experiments now on record. A little reflection will satisfy us that the draught of the plough is composed of two elements, one of which is the mere force necessary to move the plough, resting on its sole in an empty furrow or on the surface of the ground, and the other force necessary to cut and turn the furrow or do the work of ploughing. The heavier the plough the greater the force necessary to move it along the surface. In a series of experiments published by Mr. Pusey, in the English "Agricultural Society's Journal," it appears that the average draught of nine different ploughs in an empty furrow was in proportion to the weight as three to four; that is to say, that a plough of 300lbs. required a force, as shown by the dynamometer, of 225lbs. to move it when not at work. By the same experiments, it appears that the average draught of the same ploughs working and turning a furrow 9 inches by 5 inches, was a fraction less than double their draught in the empty furrow. Later experiments confirm this result, and it may be taken as demonstrated that in the use of the heavy English plough about one half of all the force of the team is expended in moving the implement when at ordinary light work! Weights being put upon the ploughs the trials were repeated several times, the weights upon each plough being increased, and also the depth of furrow. An examination of the carefully-arranged tables given as the

result of these experiments seems clearly to establish that the weight of the plough is a constant element in the draught, so that if a plough requires 200lbs. more force than another to move it in an empty furrow, it will, other things being equal, require the same additional 200lbs. of force to move it when at work at any depth, in any soil. Taking, then, the draught of the plough in the empty furrow, which may be called the surface draught, to be three-fourths of the weight of the implement, and the weight of English ploughs for common work to be that given me at the factory of Messrs. Ransomes and Sims, 280lbs., and that of the American ploughs to be 100lbs., we have the difference in the draught 135lbs., or three-fourths of the difference in weight. When we consider that about one-half of the draught of the English plough is expended in merely moving it, we see that either by accident or science we have in the United States made a decided improvement upon the mother country in the reduction of the weight of this implement. No means are afforded us of estimating their comparative strength; but from observation and information obtained on English farms, my impression is that the compact and simple structure of our ploughs renders them less liable to break or get out of repair than the best modern iron ploughs of English manufacture.

The next point for consideration is the relative influence of the mould-board or turning process, and of the share and coulter or cutting process upon the draught, and upon this head Mr. French says: The soil upon which the experiments, the results of which are now to be stated, were made, is described as a deep, firm, steady loam, free from stones, and one-year old clover bed. The trials were made by first measuring the draught of the plough when at work in the ordinary way, and then by removing the mould-board and leaving the share and coulter to do their work of cutting without the furrow. The furrow in this trial was 9 in. by 6 in. The whole draught of the plough at work was 34 stones. The removal of the mould-board diminished the draught only to 31 stones, so that 3 stones only, or 10 per cent. of the whole draft, seemed to be occasioned by the mould-board. The surface draught of this plough was 12 stones, and subtracting that from 31 we have 19 stones as the labour of cutting the furrow-slice. Analyzing the process thus far, if those experiments are correct and reliable as the foundation for general estimates, we find that about 35 per cent. of the labour of ploughing at the depth of 6 in. is expended in moving the implement, about 55 to the operation of cutting the furrow-slice at the bottom and side, and only about 10 per

cent, to the action of the mould-board or process of turning the furrow. It will be observed that in these experiments the furrow is deeper by one inch than in the former experiments, where the results showed the surface draught to be about 50 per cent. of the whole labour. A further statement will show that this variation in the depth of the furrow will just about account for the difference between 35 and 50 per cent., set down as the surface draught in the two cases. Adverting next to the influence of the depth of the furrow upon the draught, Mr. French observes:—"From the sort of natural desire which men have to establish some principle rather than because there was any evidence of such a law, it has been supposed that the draught of the plough increases with the depth of the furrow in mathematical proportion, that is to say, according to the squares of the depth. But the investigations already made, though far from satisfactory as establishing any principle or law of increase, are conclusive upon the proposition that the increase of draught is far less than the proportion named. Much depends upon the form of the plough, and whether it is made in these trials to work much deeper than its design or structure warrants. Much depends also upon the subsoil, and especially upon the question, whether in the experiments upon this point, the plough is run at a depth so great as to strike into the hard pan, or stratum upon which the plough sole for many years of tillage run; and more than all, perhaps, depends upon the particular work in hand, whether it be in a tough sward, or in an old field. The English experiments were tried in a clover field of one year, where there could be nothing like the matted turf of our mowing lands. Taking the average of their trials, with different ploughs, it was found that it required an increase of power of about 90 lbs. upon increasing the furrow from 4 in. to 6 in., and an increase of power of 300 lbs. to run the plough 8½ in. deep. An examination of the details of these trials seems to indicate what, perhaps, might be anticipated, that the greater the draught of the plough in a shallow furrow, the less its increase of draught in the deeper furrow. This may readily be accounted for upon the idea that the heavier ploughs used in the experiments were intended and properly constructed for deeper work. From all the results yet published, it would be fair to infer that an increase of depth not beyond the reasonable capacity of the implement involves an increase of draught less than half that stated in the books as the rule; that is according to the squares of the depth.

THE WADEBRIDGE FARMERS' CLUB.

At the Annual Dinner, held on Tuesday, Jan. 8, Mr. Polard, the Secretary, in answering for the Club, said: Our Chairman has a quick eye; he rightly said that he could not augur much from my appearance. I assure you it is perfectly true. Our treasurer has plenty of money in hand; but I am only sorry to say that the number of members is not so many as I could wish it to be; and it is that which has had an effect upon my countenance. It is all very well for us to be in a floating position with regard to capital. But I have long wished to see a spirit induced among our young men to support this society. It is all very well for you to come once a year to wish it success; but if you withhold your support, it is impossible we can

have any great success. No one can question that this society has been of great benefit throughout this district. Anyone who has witnessed the progress in agriculture of late years must be convinced that great benefits have resulted from the establishment of this and kindred societies. It is true that of late years publications have been introduced, from which may be learned what is doing in other districts, and persons may fancy that by this means they may get on quite as well while absenting themselves from these societies. But I believe the first cause of improvement was due to this and kindred societies. Even if there were no other reason why they are entitled to our support, the very fact of our meeting here once a year,

presided over by one of our county members, and having at the head of the table an honoured class of gentlemen whose interests are identical with those of agriculture, is sufficient proof of the benefits to be obtained from this society. It is impossible to meet here and carry on discussion without some benefit accruing from it. We may differ in politics, and with regard to county finance, boards of county expenditure, and the new way-rate bill; but no harm can ever come from discussion. With reference to this society, this day twelve months I told you that we had had some up-hill work previous to that occasion; but we wished, through the instrumentality of this society, to introduce into this neighbourhood some reaping machines. We all know that of late there has been a good deal said about new implements of husbandry. We do not anticipate seeing the steam plough worked in Cornwall. But a reaping machine has been found adapted to the cutting of grain in this neighbourhood; and as it is a novelty in Cornwall, and as we have not the opportunities here of seeing repeated trials, as may be seen in the midland counties, we think we cannot do better than to introduce a reaping machine into this neighbourhood through the medium of this society. We therefore resolved to withhold giving farm prizes for two or three years, so that we might be able, by accumulation of funds, to introduce a reaping machine into this neighbourhood. I am happy to tell you that there is in the treasurer's hands about £20—ample to buy one of the smaller machines. There are many such—Cuthbert's, Wood's, McCormick's, Humphrey's; and we have sufficient funds to purchase one of these. But it would be of no use to introduce any machine that was not in every way adapted to the district; and it is the opinion of some gentlemen that we ought to have one of Burgess and Key's. I understand that a company in the neighbourhood of Probus introduced one just before the late harvest: they found it answer their purpose, and were greatly pleased with it. Although our funds at present will not enable us to purchase one of these (it would cost between £40 and £50), I think we might, by advancing a portion ourselves, or by paying a year's subscription in advance, devise some means by which, before next harvest, we might be provided with one of Burgess and Key's reaping machines. Whether it would be judicious to lay out the money we have in purchasing a smaller machine, remains for gentlemen to determine. My belief is that, if we have a machine at all, we should have a first-rate article. I know there are gentlemen in the neighbourhood who are waiting to join our society when we have a reaping machine. But I would remind parties that it would be unfair that they should come in, and have the benefit of the machine, by merely paying the ordinary yearly subscription. If they come in, to have the benefit of the reaping machine, it is only fair that they should pay, as entrance fee, the same that we have paid individually towards the accumulation fund for its purchase, since we have been withholding the farm prizes. I believe the best way of introducing any new and expensive machines into this district will be through the society. We know that some few years ago the Probus Farmers' Club introduced a comparatively new breed of cattle—the shorthorns. It would have been a loss for one individual to have incurred so great an expense and risk. But in a company, if loss occurred, the loss to individual members would not much matter.

Mr. OLIVER, in responding as a successful competitor,

said he had been a regular subscriber to the club, and a successful competitor ever since he came into the neighbourhood, 18 years ago. Grass, he thought, demanded more than ordinary attention at this time, since cattle and sheep were more remunerative than grain, particularly in the humid climate of Cornwall, where, in consequence of mines and other kinds of employment, labour was higher than in most other counties. In order to increase the quantity of grass on his farm, he had for several years past sown two cwt. of the N.C.F.M. Co.'s Superphosphate per acre with his grass seed, on which the effect was very apparent as well as in the barley crop, either of which paid him for the outlay. He also applied greater part of his farmyard manure on grass land, and by so doing was enabled to keep a much larger amount of stock than he could otherwise. He thought more of the best land in Cornwall could be profitably laid down to grass; but in so doing, it should be well seeded out, and manured two or three years on the green, in order to produce a thick sward. He was sorry to find that this club, as well as several other meetings in the county, was in a languishing state. He thought, however, it was easily accounted for. At our seats of learning, in our army and navy, as well as in the civil service, merit was rewarded by promotion; but such was not the case with the agriculturists in Cornwall, where land generally was let by tender to the highest bidder, irrespective of his qualification as a farmer. Some one perhaps would say, you are rewarded by the prizes offered by those societies; but he contended that the winners were generally direct losers. Those who had obtained prizes at that club for the best-managed farms had invariably employed unnecessary labour, and incurred other expenses that made it unprofitable; others, who took prizes for breeding-stock at exhibitions of that kind, generally were at considerable expense in obtaining the prize animals, which were seldom sufficiently appreciated by Cornish farmers, many of whom would breed from indifferent animals to save a shilling in the expense of driving a few miles; whereas, as in some other counties, it was common to receive from 1*l.* to 5*l.* for the hire of a bull, and to sell young animals of the kind at 100*l.*, that would not fetch 20*l.* in this county. Under those circumstances, he said there was no chance of Cornish breeders competing profitably at the Bath and West of England meeting shortly to be held at Truro. Now, to remedy this state of things, he would suggest to landowners the propriety of doing away with the present system of letting farms by tender, by having a fair price put thereon, and then selecting the tenant who could produce the best testimonials. Meritorious farmers would then be encouraged and rewarded, societies of this kind strengthened, and agricultural improvements rapidly progress. As things stood at present, he considered that the greatest blessing accruing from those societies was their annual gatherings, which afforded social intercourse; tenants had their opportunities of meeting their landlords and expressing opinions affecting their united interests; constituencies had opportunities of meeting their representatives, and discussing county business and other matters affecting their interest, instead of holding exclusive meetings at boards of guardians, where many unjustifiable charges had, through ignorance of the laws, been brought against magistrates, whose only duty was to see them carried into effect. If our laws were defective, he said, prudent persons would go the head of the well, and request their representatives in parliament to get them amended.

ON A NEW METHOD OF PLANTING HEDGES.

By ANDREW TAIT, Bankhouse, Penicuik, Land Steward to the Right Hon. Sir George Clerk, of Penicuik, Bart.

[Premium—The Silver Medal.]

Among the many improvements recently adopted in the art of agriculture, thorough-draining stands pre-eminent. Whether considered as a means of multiplying the food of man or animals, extirpating noxious weeds, or improving the quality of grasses, its value is incalculable. In addition to results so favourable, a considerable saving of seed is secured, a greater regularity in the germination, growth, and ripening of produce; and, what is of great importance, stock is allowed to depasture readily upon land which formerly was obnoxious by its moist and spongy character. But the benefits arising from this process, when combined with subsoil-trenching, are rendered both more numerous and efficacious. From recent experiments it has been found that, by this combination, a greater mass of the soil is pulverized, and a freer aeration is allowed to take place, which is necessary to supply the plant with food indispensable to its full nourishment and growth. It may also be observed, that such operations modify the climate and temperature of the soil, and thereby better maintain the healthy condition of the plant.

Upon the advantages thus accruing from drainage to vegetation in general, it occurred to the writer of this paper that with equal success the same principles might be adopted in the rearing of hedges. He accordingly tried the experiment in a field, the soil of which is of a tilly nature. Its altitude is 700 feet above the level of the sea, with a north-westerly exposure, and void of shelter. This he did by causing a drain to be dug 4 feet deep, using $1\frac{1}{2}$ -inch pipes and collars, and the margins to be trenched 2 feet in width on each side, and to the depth of about 20 inches. A bed for the thorn-plants was then taken out, and they were planted, 4 inches apart, immediately above, and in a direct line with, the pipes. The field had been previously thorough-drained to the depth of 4 feet, and the drains were distant 9 yards from each other. The hedge-drain was placed half-way between the field-drains; and in order to test the efficacy of the plan, one-half of the line of fence was trenched 5 feet wide, without a drain; and there being an inequality of the surface, it was supplemented with soil from another part of the field.

In comparing the two hedges, we shall suppose No. 1 to represent the portion having the drain below the plants, and No. 2 the other method.

The hedges were both planted on the 12th April, 1858, and were cut over at the height of from 5 to 6 inches in November following; and at the present date (October 22nd, 1859) the greatest length of the young shoots of No. 1 is 3 feet $10\frac{1}{2}$ inches, with a thickness of three-eighths of an inch; while that of No. 2 is 3 feet 7 inches, with a thickness of five-sixteenths of an inch. The medium length of nine measured shoots of No. 1 is 3 feet $6\frac{1}{2}$ inches; and of No. 2, 3 feet $1\frac{1}{4}$ inch. Upon examination of the roots, it was found that No. 1 sent these downwards to a depth of 24 inches, while the fibres of No. 2 inclined to run more horizontally, their greatest depth being 17 inches. Immediately above the drain the soil was quite moist, while that of No. 2 was dry. The thorns of No. 1 sent out shoots

from the surface of the ground to the top, where the plants were cut, and No. 2 had the whole of the shoots springing from near the top of the old stem. The under-shoots of No. 1 tend to grow horizontally, while those of No. 2 take a slanting direction, leaving the old stem quite exposed.

The cost, compared with that of a hedge planted on the edge of a ditch, will be found in favour of the new plan, when the first cost and keeping up of the ditch are taken into account, besides the saving of ground occupied by it. It may be observed that this drain will stand for one of the common drains of a field, and should not, therefore, be charged to the hedge; but we will assume that the fields on each side of the proposed fence have been already drained, and that the drain dug for the hedge is unnecessary for the proper drainage of the field, in which case the whole expense would then fall on the fence. The cost per rod of a hedge planted in this manner, reckoning pipe and collar to cost, including carriage, 30s. per thousand, and two-year bedded thorns, 12s. per thousand, viz. :—

	s. d.
Cutting and filling drain and laying pipes	0 10
14 pipes and collars, at 30s. per thousand	0 5
Trenching 20 inches deep, 5 feet wide	0 4
50 thorn-plants, at 12s. per thousand	0 7
Planting do.	0 2 $\frac{1}{2}$
	2 4 $\frac{1}{2}$

Or not including cost of drain, 1s. $1\frac{1}{2}$ d.; while the old method of hedge and ditch will cost the following, viz. :—

	s. d.
Cutting ditch	1 8
50 thorn-plants, at 12s. per thousand	0 7
Planting do.	0 2 $\frac{1}{2}$
	2 5 $\frac{1}{2}$

In summing up the advantages of this method, it may be reasonably expected that the plant will have a more equal supply of moisture. Even in a dry season, the air passing up the pipe, and acting with that of the atmosphere above, will cause moisture to circulate through the soil by capillary attraction. The roots, by the trenching, have an increased space to seek for nourishment. Moreover, a saving, as has been already stated, is obtained in the drainage of the field, and less ground occupied than by the old method of hedge and ditch. From the equalization of temperature thus produced in the soil, the plant will be more vigorous in spring, and better enabled to send forth strong and healthy shoots.

The appearance of the two hedges on the 26th October, 1860, still shows a decided superiority in favour of No. 1. The strength of its stems, the number and length of the young shoots proceeding from these in lateral, sloping, and vertical directions, together with the density of the lower part of the hedge No. 1, furnish the most convincing proof of its more rapid growth, when contrasted with that part of the hedge designated No. 2. A few measurements just taken on the spot will serve to support the above assertions, although the apparent smallness of difference of these in

detail does not serve to convey a just idea of the more striking difference which exists in the general aspects of the two parts of the hedgerow; and this may be accounted for by the greater number of unmeasured shoots laterally and vertically, which, not being represented on paper, yet sufficiently indicate the superiority of Section No. 1. Taking a number of the strongest stems in each part of the hedge, the average thickness of these in No. 1 was nine-sixteenths of an inch, while that of those in No. 2 was eight-sixteenths. Again, taking several top-shoots in each, the average length of those in No. 1 was 3 feet, while that of those in No. 2 was 2 feet 8½ inches. The average length of the longest side-shoots in No. 1 was about 2 feet, while those in No. 2 averaged 1 foot 7 inches.

Before trying the above experiment, I was under the conviction that the thorn, being a surface-rooted plant, and requiring only a certain amount of moisture for its healthy growth would in all probability send its roots no further than where they received the requisite supply, and thus leave the drain uninjured. I have only to add that this opinion is borne out by a great many extensive and skilful drainers with whom I have conversed on the subject, and who have informed me that they have never found the roots of the thorn penetrating the tile crossing underneath a thorn hedge.

The above experiment adds another proof to the advantages derived from thorough-drainage combined with subsoil-trenching.—*Journal of Agriculture.*

ON THE IMPROVEMENT OF THE KYLOE.

Under this heading we propose reviewing the means practically within the reach of landowners and farmers for the improvement of the native breeds of cattle in our highland districts, addressing ourselves principally to the Kyle of the north.

The Highland ox, when properly attended to, is an animal possessing many first-rate qualities. In a pecuniary point of view he is no less "a feeder's ox" than "a butcher's one," while to the consumer he is far ahead of any of his rivals as to the quality of meat his carcase furnishes for the dinner-table. To the breeder he is without an equal as to health, hardiness, and the simplicity of his dietary; while his muscular development and superiority of functions generally command for him the patronage of the artist, the naturalist, and physiologist. In short, without wishing to say a word against the merits of the improved Shorthorn, Devon, and Hereford, the Highland ox has always been a favourite at our Christmas fat-stock shows, as he pre-eminently was at the last Smithfield Club meeting, and we venture to say will continue to be so, for many reasons, as the more his acquaintance is formed by the general public (if we may use the phrase) the more his many good qualities are likely to be appreciated:

It is only, however, a select few of this breed that attain to such a degree of pre-eminence, a large proportion of the whole being stunted, coarse in symmetry, and slow feeders, affording unmistakable evidence of improper management. It is such characteristics as these which have from time immemorial given rise to the many articles that have been written on the improvement of the Kyle. What every grazier has examined in the markets of the north is only what may daily be seen exemplified in those of the south, where improved breeds have been stunted in growth or otherwise improperly attended to, similar causes everywhere producing similar results.

As a breeding stock the Kyle is well adapted for the highlands of the north, if not equally well for the mountainous parts of Wales and Ireland. In point of fact he is the natural product of the Scottish hills, exemplifying in his appearance and muscular energy all the characteristics of legitimacy.

That our improved Shorthorns, Herefords, and Devons could be naturalized to the northern highlands is no doubt true. What changes might take place as to early maturity, weight, and quality of meat, are questions upon which we

shall not speculate, the practical conclusion being manifest that those who have any experience in their management, and also of the Kyle, would never for a moment think of introducing the former to supplant the latter amongst their native glens. No doubt in the lowlands, along the Moray, Beaulieu, Cromarty, and Dornock friths, where the climate is superior to that of Buchan and Strathmore, or the east generally, and where arable husbandry is successfully pursued, the improved Shorthorn, Hereford, and Devon could be bred and fattened; so could first crosses of these with the Kyle; but so long as the latter can be improved without lowering the superiority of his meat, any system of crossing can only be accepted as a very problematical one, if not actually shortsighted and objectionable.

To what extent, therefore, can we bring artificial means to bear upon the improvement of our Highland cattle amongst their native glens? Can we give them at home a perpetual Summer? and if not, how are we to secure a uniform system of dietary, so as to make the most of them when sent to the lowlands for wintering, or to the South to be fattened out for the shambles of the metropolis and other large towns?

In agricultural progression it is always a wise maxim to examine carefully the ground on which we at the time stand, before a single step is taken in advance in any new direction, and the solution of the above questions will be found no exception to this rule. Let us, therefore, examine carefully our present management of the Kyle, with a view to ascertain its shortcomings, and the artificial means whose adoption is necessarily involved in their removal.

According to the old proverb "it is the food that makes the cow," and just so it is with the ox; it is the vegetable produce of the Highlands that makes the Kyle what he is, where we find him in his highest degree of perfection. If, therefore, we wish to improve the latter, we must begin by improving the former. And by parity of reasoning, if we can improve his pasture and climate, it consequently follows that we can improve the Highland ox himself.

That the pasturage is susceptible of improvement by drainage, irrigation, shelter, and the introduction of new forage plants, no one will question who has set a foot in the Highlands with a view to examine their capabilities in this respect. The only part of the problem where diffi-

culty is experienced is to invest capital, so as to make it pay adequate interest. In almost every glen and hillside wonders could be effected, in magnitude outrivalling the Babylonian terraces of oriental history; but when we turn to the pecuniary side of the story, it is then "the toes begin to feel where the shoe pinches."

But with all the adverse circumstances experienced in the Highlands, much capital may nevertheless be profitably invested in improving the pasturage of the deep glens and rugged hillsides, where the Kyloe gathers his food. The improvements, it will be seen, are of a fourfold character, and the successful execution of the general work is to make the different divisions into which it subdivides itself co-operate together for the common cause, so that no labour shall be lost, or capital fruitlessly expended, as is often the case, something having to be done twice and thrice before a satisfactory finish is effected, and a return for capital realised.

A large area of the Highlands requires draining, and is at a level sufficiently low to pay for deep thorough drainage. Nothing short of this will repay the outlay of capital, while effectual drainage, with the other improvements, will return remunerating interest on the whole investment. Of all the lands we have examined between the Land's End and John o'Groat's, those of the Highlands, especially on the west coast, are the most thankless for half-done works of this kind, there being almost invariably a large supply of bottom water on a sloping surface, besides heavy falls of rain and snow. In short, the work must either be thoroughly done or let alone, and the former is the more advisable, because more profitable of the two.

In many cases that have come under our notice, the quantity of bottom or spring water which could easily be drained from one district, might with equal ease be used for the irrigation and warping of, another on a lower level. By such means "two dogs would be hit with one bone," and much land that is now covered with poor heath converted into grass, yielding a sweet and nourishing bite to both cattle and sheep. Some of these cases are interesting from an engineering point of view, as the water drained from one hill side had, by 300 yards or so of piping, to be carried under a small rivulet, for the irrigation of the dry heath land on the opposite hill-side. Let no poverty-stricken laird or penurious chief be startled at such a proposition, for we ourselves were somewhat surprised at the little money its practical solution would have required, and the quantity of water which could thus have been brought to bear upon the irrigation and warping of a large area of land only yielding heath. In other cases a very small quantity of piping would send the small rills, that now bubble uselessly in the bottom of the valley, dashing from one level to another over rocks, pebbles, &c., playing upon the dry comparatively barren heaths on either side. In short, a draining engineer would find no difficulty in expending his ingenuity upon irrigation and warping works of this kind amongst old Caledonia's heath-clad hills and mountain streams equally to the advantage of the landlord and the tenant.

Almost in every case where drainage and irrigation can be profitably carried out, shelter is also required. Indeed so imperatively necessary is this, that it may not inaptly be said that upon shelter the profits of the whole improvements depend, for exposed to the inclemency of the weather, in spring and autumn more especially, herds and flocks would suffer so much as to render interest on capital a very problematical affair, while the pasture itself would

also be checked in growth and reduced in quality. But with proper shelter, the inclemency of those two periods, the first of spring and last of autumn, now so starvingly ruinous to cattle, would be greatly modified, even in the most exposed places.

Evelyn, in his "Silva," proposes planting the Sussex and Hampshire Downs to afford shelter to stock; and no doubt his proposition could, at the present day, be carried out with advantage. Likewise, belts of wood could be planted in many parts of the Highlands, to afford shelter to cattle; but in numerous cases it is otherwise, the exposure and severity of the weather being such that trees could not stand the storms of the north, were it possible for them to be grown. In such places shelter must mean anything that will carry the blast over the back of a Highland ox or black-faced sheep: so that in practice it just means anything, from a large stone to a forest, every case being subject to its own circumstances.

That drainage, irrigation, and warping, where practicable, with shelter, would naturally improve the pasture, is one of those questions that may be taken for granted. Set up a stone anywhere, and the heath is a very barren one if it does not improve the pasture, for with few exceptions grass will be found ultimately to make its appearance around the edge of the stone where it rests upon the ground, while in some cases the green sward will extend outwards a foot and more around it. The same result is produced around any kind of bush that is grown, while some bushy plants, as furze, afford at the same time excellent food for sheep. We have raised fine hedges or belts of furze by sowing the seed on two plough-furrows drawn some twenty feet asunder across a very poor heath, worthless before, but affording fine shelter and no little food to sheep, after the furze was up a few feet in height. In two examples of this kind, had water been brought to bear upon the irrigation of the intervening spaces, there cannot be a doubt but the result would have been still more favourable from the shelter the furze afforded. To make the shelter and water act together so as to produce the greatest effect, furze hedges or sheltering works of any other kind must correspond with the works for irrigation; so that practical details of this kind involve no little ingenuity in carrying them out successfully at a small outlay of capital.

Having made provision for the Kyloe during the summer season, we now come to examine his present treatment during the long stormy winters of the north, when stock must be withdrawn from the hills to strawyards and homesteads, generally on arable farms, at a lower level. This is necessary before we can start the first foot in the march of improvement.

The change of diet and confinement to which the Highland ox is subjected in our strawyards during the winter season is far from conducive to his physical development and general well-being. The utmost that can be said in its favour is that it is the least of two evils in the generality of cases—better than exposed hill grounds deficient of roughness left during summer, but worse than many a sheltered glen with plenty of Highland fare at Christmas. The fact is notorious, reflecting in no very favourable terms the progress which ~~art~~ has made in the lowlands relative to the wintering of stock. Where the Kyloe is left to graze with red-deer in his native glens during the inclemency of winter, we then find him before midsummer in the following season a long way ahead of his companions that had been wintered in the lowlands and returned

to the hills in spring. The contrast obviously presents us with a case against SASSANACH homesteads, food, and management, that calls for a little friendly animadversion, with a view to progress; for if we are to lose in the low country what we gain from the improvement of our hill pastures

by drainage, irrigation, shelter, and better herbage, the investment of capital cannot be expected to be otherwise than lost money. The details of so comprehensive a question must be reserved for another winter evening's lucubration.
D. A.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND, AND RIVER REFORM.

BY A PRACTICAL FARMER.

In common with every agricultural improver, I have watched with great interest the movement now making to obtain perfect arterial drainage through river reforms. It is one of the most advantageous attempts ever made in the promotion of this great desideratum in modern English agriculture. Drainage—perfect drainage—is the salvation of all soils subject to the weeping skies of this country; and no true friend to British agriculture will quietly rest, till he has effected all that is to be accomplished in order to secure this inestimable benefit. Subsoil-drainage has become universal: even “The great level of the Fens” has liberally adopted the system; and considerable breadths are underdrained in various ways, which, owing to deepened outfalls into the sea, are kept dry. The great hindrances to a perfect system of subsoil drainage is owing to the innumerable internal drains being in such a defective, or, rather, obstructive state; and this includes our rivers and streams, brooks, ditches, in fact every watercourse of every description. Every farmer has cause to complain of some unfortunate stoppage of his waters on some portions of his farm, and gives way to laments like these—that if that heading was lowered, or that little ditch might open into neighbour Wiles’ ditch, or that the drain could empty into the river, or that the river could be let off at the mill-dam, or those little arches of the bridge made wider, or those queer windings made straighter (and various other similar lamentations), what grand improvements could be made in his farm drainage! It is so universally, and yet there is great supineness upon the question. The great impression is, that the complication of interests are so manifold and great that it is next to impossible to grapple with them. And why is this foolish impression so strong, and so largely indulged? Because of the ignorance which prevails upon the subject. Here lies the great difficulty. It is not my province to open out the whole subject. It has been done by far abler pens than mine, so far as it is known, and precious little it is. One would think that the disastrous floods we continually read of would spur our improvers onward, and both the farmer and the doctor would heartily join in stemming the evil alike injurious to all.

The Government ought, unquestionably, to obtain all the necessary information possible upon the condition of our rivers and outfalls, with a view to their reform. It is a Government question, as it relates to a great national improvement; but we all know that Governments are slow to take such up. It has from time to time been urged upon our Legislature, but without

effecting much good; almost every member thereof has some objection, owing to local difficulties—a mill here, or an ornamental water there, or the fishery will be injured, or the navigation stopped, or, at least, the barges will be delayed, or the thousand-and-one other objections that start up, so that, hitherto, river reform has been a dead letter.

Now, we have seen over and over again, in this free and happy isle of ours, either that private enterprise or public companies have done nearly all the good that has ever been achieved. And why? because of the security guaranteed by our noble institutions. Well, the Government move remarkably slow in all matters connected with agricultural improvement. If our progress had been left in the hands of Government, what would have been our condition now? If Government ever did anything, it served to retard rather than promote advancement. Be that as it may, we are now on our own sound legs, good and strong; and let us use them as best we can, and never flag.

With reference to this question of arterial drainage, or river reform, as it is now designated, if the Government are indifferent to its importance, our great Society is not. It has offered a prize of fifty pounds for the best report on arterial drainage; and no one who has read the admirable report that offer produced, can be indifferent as to the subject. Its importance is generally acknowledged, and the more it is discussed the more will it appear. The great fact is, that we comparatively know nothing about it. We have no authentic report of our rivers that we can refer to. All we know or hear of, are disastrous overflows, accidents here, bridges carried away there, and the like, given us through the medium of the newspaper press. A great country like Great Britain surely ought not to rest thus. As our Royal Agricultural Society of England has begun the inquiry, could it do a more beneficial thing than carry it on? It has funds in abundance at command. It devotes specific sums for specific purposes continually; and none more important or more beneficial to agriculture than this. There would be no insurmountable difficulty in obtaining the desired information. Competent men may readily be found to carry out the inquiry. It would involve the actual inspection of all our rivers, and many of our more important tributaries. This, with judicious inquiries on every point and in every possible way, would produce a body of evidence and reliable information of the utmost value. It need not be expensively conducted. I should suggest that

one or two trustworthy men be first engaged, and thus try the experiment. It would very soon transpire what measure of success attended their efforts. Their object would be to ascertain and report upon the capacity of the various rivers for carrying off the floods; the obstructions from improper bridges, mill-dams, weirs, staunches, unnecessary bends; the rights of owners, corporations, navigation, and the extent of land damaged by flooding, or to be rendered more valuable by reclamation; the state of the various tributaries to these rivers, streams, brooks, &c., and wherein these require improvement so as to benefit the upper country in respect to subsoil drainage and the speedier transit of

their waters. They should also note the river outfalls, with suggestions for their improvement if required; and the extent of land to be regained in every way, and its value; with any other relative information conducive to the spread of agricultural knowledge.

I cannot think the Society would be departing from its acknowledged duties in undertaking this highly useful and laudable engagement, fraught as it must be with vast results. A body of information thus brought together would form the basis for legislation, or any other course which might ultimately be adopted for improving the rivers or reclaiming the lands subject to their influence.

THE SEWAGE QUESTION.

We have deprecated the grandiloquent language about our "beds of guano," which some have indulged in, because we object to the introduction of fine phrases into a purely practical question. If *pure* guano could for ever be got for £10 a ton there would probably be no occasion to advocate sewage irrigation, and we might confine ourselves to the subject of deodorizing for the rest of our lives; but in truth, although our supply may be ample for this and the succeeding generation, it is never pure, and the supply will probably fail us in thirty years or less.

A brief glance at the causes which make guano a present blessing, and may make the use of sewage a future necessity, may not be out of place here. Of all the chemical products of the soil, the return of which is necessary to keep up equal fertility, the phosphates are those which appear the most difficult to obtain save through the agency of man, beast, or bird, and by the ordinary process which belongs to daily life. We extract these phosphates in the food we grow; they are the agents which help to build up the bony structure of man and beasts, and they pass off into our sewers and stable-yards, and are seen also in the deposits of guano on the coast of South America. Most of our readers know that few lands have a succession of wheat crops; and the fertile lands where tobacco grows are gradually exhausted, because the phosphates and other salts extracted by the plant are not returned in like proportion.

If English lands are less poor than others, it is because the phosphates are returned in the shape of farm-yard manure, and of late years in the form of bone-manure and guano, and the result would be still better if these latter were put on in an unadulterated form. We learn from an interesting paper, read before the Academy of Sciences at Paris, by M. Boussingault, that in some places on the Peruvian coast the lowest guano deposits are covered with a stratum of alluvial soil, and that on this a fresh deposit of guano is again covered by a second stratum of sand. The slight admixture of soil with the manure which is due to these causes is not thought sufficient for English commercial ideas, for we understand that the light, friable loam from the Epping Forest is mixed with the guano in lighters in the Thames, and sold to the public as the genuine article fresh from Peru! Now, if we think that the English farmer objects to carting on to his land a mass of inert matter which should form part of a solid sewage manure, we are certain that he will still more object to paying for loam at the price of guano, and, when the adulteration to which it

is subject becomes better known, it will probably find less favour than heretofore in the eyes of the agriculturist. The same remark holds good with reference to bone manure, which is still more difficult to obtain in a pure form. These facts lead us to regard any proposition for utilising sewage by means of irrigation with even greater favour than its mere relative value, when compared with *pure* guano at a fair price, would induce; and a careful consideration of the whole question leads us to look forward anxiously to the result of the proposed experiments at Croydon.

With every disposition to encourage a well-organized system of sewage irrigation, we cannot help seeing that local arrangements and the caprice of landowners may render it far from practicable within the metropolitan area. It remains for us to deal with the several methods that have been proposed for deodorizing, and pick out from among them that which we think offers the best evidence of doing its work effectually and economically.

If plans have been numerous for turning sewage into manure, they have been no less so for making the former compound harmless previous to its incorporation with the river water; nay, methods have been devised for making the river itself sweet after the garbage of London has been thrown into it. Among the impracticable ones, we notice one by Mr. Burness, who proposes to have separate systems for sewage and surface water; the latter of which he would filter, and the former disperse, by means of pipes, into the country; on the ground that its value is, in reality, much greater than chemical analysis would show, "because," he says, "during the process of decomposition of animal and vegetable matter, oxygen is worked up both from water and the atmosphere; consequently hydrogen is liberated from the former, and nitrogen from the latter; so that these two, uniting, form ammonia, one of the best fertilizers." Unfortunately for this pleasant theory, which would give us so easily a compound worth £56 per ton, nitrogen, the important element in ammonia, is not exhibited in a nascent state, and therefore could not combine with hydrogen. We have dwelt on the method rather for the sake of showing how elegant a theory may be constructed when chemical facts are disregarded. Perhaps Mr. Andy's manganates and per-manganates offer the best means of deodorizing, if they were not so uncommonly expensive. Ferruginous sulphate of alumina, proto-sulphate of iron, and chloride of sodium, combined with hydrochloric acid, pyritous peat, carbonate of lime, and many like chemicals, have been suggested, but

are all alike open to practical objections. Dosing the river with common salt was proposed by one gentleman, and Messrs. Deally and Richards have devised a plan for discharging chlorine gas from a river steamer, whilst passing up and down, in a manner certainly "never before invented;" but if we smile at the novelty of the idea, we are very far from saying that such a method is either impracticable or absurd. It is perhaps a pity that the method of deodorizing by galvanic agency, suggested by Mr. Allen, and so strongly urged years ago by Mr. Crope, did not receive a practical trial by Dr. Hoffman; but we feel quite sure that, in disregarding it, he has been actuated by no feelings of prejudice, although the nature of their report does not evince any decided reason against its use.

The same remark applies to the alkaline solution of carbonic acid, which is in use at Carlisle, but which Messrs. Hoffman and Frankland passed over, with many others, as "not possessing that combination of properties which could warrant them in recommending it to the Metropolitan Board of Works for the deodorization of the human sewage." We are assured by Mr. Bateman, the eminent engineer, and by Mr. Holland, one of the Inspectors of Burial Grounds, that the action of this alkaline solution at Carlisle is most effective, and it appears to be cheap, and we confess that, in the interests of deodorization, we should be glad to know why an agent which is said to succeed at Carlisle is inapplicable at Chelsea.

Of all the compounds laid before Messrs. Hoffman and Frankland last year, only three appear, in their opinion, competent to do the work of deodorizing in an effectual manner. These are lime, chloride of lime, and perchloride of iron, and the quantity of each necessary for deodorizing 1,000,000 gals. appears, by accurate experiments, to be 66 gals. of perchloride of iron against 400 lbs. of chloride of lime, and 132½ bushels of lime, the value in figures increasing from £1 13s. 3d. for the perchloride, to £2 2s. 10½d. for the chloride, and £3 6s. 6d. for the lime itself. As these compounds increase in cost, so they appear to decrease in action; for lime is the inferior of the three, both in immediate action and permanency of effect. After two days sewage, affected with lime will evince signs of being tainted, whilst the sewage deodorized by the first two compounds will be perfectly odourless. After four days the sewage to which chloride of lime has been added will begin to be offensive, whilst that treated with the perchloride of iron is till inodorous, and, even after nine days, the condition of the latter is shown to be the same.

The efficacy of this agent is likewise confirmed by Messrs. Versmann and Rogers, and it is quite refreshing to see men of such great scientific attainments hail the appearance of a new method so cordially, and without a particle of that professional jealousy which sometimes afflicts men who are judges on the inventions of others. Messrs. Hoffman and Frankland, after witnessing the effect of the perchloride of iron, express the opinion "that the disinfection of vast volumes of sewage can be more easily accomplished than is generally believed, or than they themselves anticipated at the commencement of their inquiry;" and Messrs. Versmann and Rogers, in a similar tone, expressed their surprise, and add that they were not prepared to witness so complete a success, this latter remark having reference to some trials of Mr. Dall's fluid on Croydon sewage. All this is very encouraging, and shows what a vast stride has been made since Messrs. Hoffmann and Witt concluded their Report to the Metropolitan Board of Works in 1857. That Report, to which

we have frequently had occasion to refer in these remarks, albeit it was full of the most accurate analyses, and showed us most clearly what could *not* be done, left us without any definite proposal for even the deodorization of sewage, and, in this respect, the gap has been well filled up by the more recent experiments to which we have referred. We shall defer to another number our examination of the objections which have been raised to the perchloride of iron on sanitary grounds, and we shall conclude this article by remarking that its use, if ever so effectual, has still left unsolved the problem of how we shall best dispose of the deposit which may be separated by filtration or subsidence, and the rapid removal of which from the reservoirs is of the utmost importance. It was not long ago that the inhabitants of Paddington were frightened at the prospect of the removal of the trifling deposit that might be formed in the proposed filter beds at the head of the Serpentine. What will the ratepayers of Chelsea say when the suspended matter, in a daily discharge of nearly 1,000,000 gallons, has to be disposed of after the liquid deodorized portion has been discharged into the Thames?—The Engineer.

TITHE COMMUTATION. — SEPTENNIAL AVERAGES.

SIR,—As many of your readers may feel anxious to know the result of the Corn Averages for the seven years to Christmas, 1860, published by authority in the *London Gazette* of this evening, viz. :—

	Per imp. bush.
Wheat	7s. 4½d.
Barley	4s. 7½d.
Oats	8s. 2d.

I beg to state for their information that each £100 of tithe rent-charge will for the year 1861 amount to £112 8s. 4½d., which is a little more than 1¼ per cent. above the last year's value, which was itself the highest of the 24 preceding years. The value for 1855 was only £89 15s. 8½d., or 22½ per cent. below the value for the current year.

The following statement from my *Annual Tithe Commutation Tables* will show the worth of £100 of tithe rent-charge for each year since the passing of the Tithe Commutation Act, viz. :—

For the year	£ s. d.	For the year	£ s. d.
1837 ..	98 13 9½	1852 ..	93 16 11½
1838 ..	97 7 11	1853 ..	91 13 5½
1839 ..	95 7 9	1854 ..	90 19 5
1840 ..	98 15 9½	1855 ..	89 15 8½
1841 ..	102 12 5½	1856 ..	93 18 1½
1842 ..	105 8 2½	1857 ..	99 13 7½
1843 ..	105 12 2½	1858 ..	105 16 3½
1844 ..	104 3 5½	1859 ..	108 19 0½
1845 ..	103 17 11½	1860 ..	110 17 8½
1846 ..	102 17 8½	1861 ..	112 3 4½
1847 ..	99 18 10½		
1848 ..	102 1 0		£2,510 3 1½
1849 ..	100 3 7½		
1850 ..	98 16 10	General average	
1851 ..	96 11 4½	for 25 years £100	4 1½

I am, Sir, your obedient servant,

CHARLES M. WILlich,

Actuary, University Life Assurance Society.

25, Suffolk-street, Pall-mall-east, S. W., Jan. 11.

THE AGE OF STOCK;

WHEN TO BE TAKEN FOR ENTRY AT CATTLE SHOWS.

At a preliminary meeting recently held at Kelso to make arrangements for the Highland Society's visit in 1862,

Mr. HALL MAXWELL, the Secretary of the Society, said what they were to-day called on to consider was, in the first place, whether the 1st of January, as at present, should be the date from which the stock should take their ages, or whether it should be changed to the 1st of October. About two years ago the whole system of the Society's Shows had been overhauled by a committee composed of gentlemen from all the different districts in Scotland, and they had framed certain general rules in relation to the Shows which had since then always been acted upon, and were to be so acted upon at this approaching Show at Perth. In reference to the question of age, that committee recommended that the 1st of January should be given up as the starting point, and that the 1st of October should be taken in its place. When he (Mr. Maxwell) went to Perth last year, he reported this change, and the doubts which the Directors of the Highland Society had to its propriety. At the meeting in Perth a memorial to the Directors was agreed to, asking the 1st of January to be again substituted as the starting point for age. The Directors agreed to the recommendation, and fixed the 1st of January as the time from which the age of stock was to be calculated, agreeing at the same time to leave the question open till the meeting at Kelso, there to take the sense of the agriculturists of the South of Scotland on the point; and if they should recommend the 1st of January, that it should be a rule of the Society. Since then a large committee have again had the matter under consideration in Edinburgh, and they have come to the conclusion that the 1st of January is the proper period from which to calculate the age. Much discussion arose at that meeting as to the propriety of having the 1st of January as the period in the case of all the breeds save Shorthorns, and it was suggested that for them the time should be the 1st of October. He had taken the trouble to see whether there were many Shorthorns calved in the three months before January, as some exhibitors had complained that the stock which was calved in October or November was not put in with that calved after the 1st of January. Well, it was found that of 233 head of cattle only eight had been calved between the 1st of October and the 1st of January, and out of 86 Shorthorns at the Edinburgh Show the numbers calved in the three preceding months had only been five. At the Dumfries Show, of 75 Shorthorns the births had been five in the three months preceding, and out of 223 of all other breeds not one had been calved in these months. The Committee of the Society were of opinion that any alteration now would increase the number of such complaints as he had alluded to, and would otherwise be very inconvenient, and they recommended that the 1st of January be retained as the period for calculating ages from. He (Mr. Maxwell) had been desired to bring this subject under the notice of the meeting with a view of arriving at a final decision, and he now left the matter in their hands.

Sir WILLIAM SCOTT said the Royal Agricultural Society adopted the 1st of January as the date, and they had a

good precedent in the case of the breeding of race-horses. In former days it used to be counted from the 1st of May, but afterwards this date was altered to the 1st of January. This had continued now for many years, and everything had gone on very smoothly and harmoniously. He could not help thinking that the breeders of race-horses—who were generally a sharp-witted class of people—had not adhered to this date without good reason. The case of prize cattle was quite analogous to race-horses, and he thought that the same rule in this respect should be held to apply in both cases.

Mr. CURRY, solicitor, said that the period for calculating ages of stock in connection with the Union Agricultural Society was always the 1st of January, and it had been found to work well on all occasions.

Mr. DUDGEON, Spylaw, said he only spoke what he believed to be the unanimous feeling of the meeting when he moved that in the opinion of the present meeting the present rule, fixing the date at the 1st of January, should be adhered to.

Mr. FAIRBAIRN seconded the motion, which was carried unanimously.

OUR FARMERS.

Their homes are their castles, their hearthstones a throne—
They rule with no sceptre the kingdoms they own;
The stalks, and the vines, and the fruit-bearing tree,
Are subjects that bend not to tyrants the knee;

But bend with the weight of the orchard and field,
Ever loyal and faithful, a harvest to yield;
No planning and plotting among them is known,
No traitor the sovereign would strike from his throne.

He stands 'midst his acres of grass, wheat, and maize,
Like Crusoe, "the monarch of all he surveys,"
His banks are the earth-banks that stand on his farm—
The banks that are safe when the panics alarm:

The stock is the cattle—not *fancy* in breed;
The shares are the plough-shares that score for the seed,
Not quoted on 'Change in the broker's array,
But shares on which Nature will dividends pay.

Their banks are not those that the widows condemn—
No officers pilfer deposits from them;
If small the potatoes that in them are found,
Yet none are as small as we find out of ground:

The farmer with appetite ever can eat
The bread on his table, "as good as the wheat;"
And, loving most dearly his wife, he may utter,
"My bread and my wife! I'll not have any *but her*!"

With juice of the apple the wife then may fill
The glass in which lingers no tremors or ill;
And *she* may respond that, whatever betide her,
Most happy she'll be with her husband *beside her*!

There's many a hearth where the embers are glowing;
There's many a heart with its joys overflowing;
The hearths and the hearts, from the world's rude alarms,
Are safe in the homes that are reared on our farms.

NOTES ON MEADOWS AND PASTURES.

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In remarking upon the plants which are injurious to pastures, our notes would be manifestly incomplete did we not take into consideration the nature and effects of such grasses as from their structure and qualities are either innutritious or injurious, and consequently in their effect can only be ranked as weeds. These may be considered under the following heads:—

First, grasses which are injurious by reason of awns or spiculæ.

Secondly, grasses which are useless from their rigid and sapless structure.

Thirdly, grasses which are woolly and innutritious.

First, *grasses mechanically injurious*.—If the inquirer will take up a flowering spike of *Hordeum murinum* (wall barley), he will find that all the pales of the flower are terminated with straight rigid awns, forming what is called the cone or beard—the same, though differing in degree, as the cones to cereal barley or bearded wheat. These awns again have along their whole length two opposite rows of sharp *spiculæ* pointing upwards, giving them, under a lens, a peculiarly barbed appearance. Many of our readers will call to mind the manner in which they used, as a youthful trial in experimental philosophy, to put a head of barley flowers up the sleeve, and in the action of walking it would travel up to the shoulder; this arose from the circumstance that the little spiculæ on the awns would go smoothly enough if compressed the right way, but they could not be brought down the arm, as then these points would be acting like so many barbs, and they would consequently stick into the dress. Now just the same is it if taken into the mouth of cattle, these barbed awns get under the tongue, down the throat, and stick into the gums, thereby creating such disturbance and inflammation that, however good the general mass of the hay, cattle will not thrive upon it; and, indeed, we have seen cases in which the resulting irritation, from this cause, almost precluded the possibility of mastication. Now, in illustration of this subject, we may record the result of the examination of the pasture of a fine rich park in the Vale of Gloucester, the soil of which was lias clay as a substratum, ameliorated by a thin covering of ancient marine drift and river silt, as it was at one time part of the old or wider estuary of the Severn. On taking a list of the grasses (and there were few other kinds of plants), we found them to consist for the most part of the best meadow species, such as

<i>Lolium perenne</i>	•	Rye-grass.
<i>Poa pratensis</i>	•	Meadow grass.
<i>Festuca pratense</i>	•	Meadow fescue.
<i>Dactylis glomerata</i>	•	Cock's-foot.
<i>Phleum pratense</i>	•	Timothy-grass, or cat's-tail.
<i>Alopecurus pratense</i>	•	Fox-tail grass.
<i>Anthoxanthum odoratum</i>	•	Sweet vernal-grass.

Now, these grasses, with clovers, so far present us with all to be desired in a good meadow, whether for hay or pasture; but intermixed with these was a goodly sprinkling of the *Hordeum murinum* (wall-barley) and *H. pratense* (meadow barley-grasses)—the first induced to grow from the presence of sandy spots in the lighter parts of the drift covering, and the second taking a natural position in the deeper and better soils. In passing over this park in company [with the proprietor, we ventured to remark, “What a magnificent pasture, but how unfortunate for haymaking!” Now, as this investigation and the remarks thereupon were quite independent of any solicitation on the part of the proprietor, but simply the spontaneous remark of one used to such observations in walking over the estate with him, he was anxious to know the reasons for our conclusions, stating at the same time that his bailiff had always told him that this park was better adapted for pasture than hay, as the stock thrived upon the grass, while they did badly on the hay. The reasons, then, have just been explained; and when to these is added the circumstance that the foliage, and indeed all the herbage of the barley grasses, is highly nutritious, we can see how entirely this is a matter of mechanical injury, as the cattle eat the grass with avidity; so that if a pasture be examined in the autumn, as this was, the few strong culms that have seeded, and so been left by the cattle, usually only form slight evidence of the quantity that may be present, for which a correct knowledge of the foliage should be carefully obtained.

Secondly, *Hard Grasses*.—These form a somewhat extensive list, which will be characterized by a rigidity of stem and foliage; the latter, indeed, will not unfrequently be serrated at the edges with spiculæ, like those just described; so that these leaves are quite sharp-cutting instruments, that if handled the wrong way make very painful wounds; others, again, have their longitudinal veins or nervures marked by the same kinds of roughness; others are simply rigid and sapless. Of the grasses of these kinds the following are amongst the most remarkable:

<i>Avena pratense</i>	•	Meadow oat-grass.
<i>Aira cespitosa</i>	•	Hair or haddock grass.
<i>Brachypodium pennatum</i>	•	Heath false-brome grass.
<i>Cynosurus cristatus</i>	•	Crested dog's-tail.

Of these, the two former are of the rough, the latter of the rigid leaved kinds. The three first never can be in quantity in a proper meadow, as the first indicates a want of drainage, and dies out soon after this has been accomplished; whilst the two next, if found abundant, would lead us to denominate their locale a moor rather than a meadow. For the last of the list, it is but right to say that Sinclair gives it a high character; but from

having observed it for many years in a large park which is constantly well-stocked with deer, sheep, horses, and cattle, and where every other grass is "eaten to the bone," this is the only one that completes its culms and flowers in any quantity, and these stiff rigid "bents is brown" are so wholly and completely left to wither on the ground, as none of them are cropped, that they remain for months. Our opinion of this grass, then, is poor indeed; so much so, that, under all circumstances and in all conditions of soil, in laying down a permanent pasture we should most carefully exclude it.

Thirdly, *Downy or Woolly Grasses*.—A good succulent grass, may generally be known from the circumstance that its foliage is clean or devoid of hairs or down on the one hand, but not rigid or stiff on the other. The hairiness is a sign of poverty, whilst the rigidity of foliage argues an ill-conditioned moor or a poor undrained clay. In this latter decision, however, care must be taken not to confound grasses and sedges, though it will usually happen that both will be found growing under the same circumstances; though at the same time sedges of some species more particularly affect pots of sand, especially those that hold water, from being situate in hollows of clay. Bad grasses and sedges approach each other in habit, constitution, and in properties so nearly, that practically the diagnosis to be derived from them will be the same. At the same time, as a matter of scientific inquiry, we should be ever careful not to confound them. As examples of the grasses to which these remarks would apply, we may quote the following:—

<i>Holcus lanatus</i>	.	.	Woolly soft grass.
" <i>mollis</i>	.	.	Soft grass.
<i>Bromus mollis</i>	.	.	Lop or annual brome.
" <i>erectus</i>	.	.	Upright brome.
<i>Avena pubescens</i>	.	.	Hairy oat-grass.

Of these, the two first are sometimes called "fog grasses," from their wet aspect in the mornings of autumn. The vapour condensing on their hairy structure, they are generally distasteful to cattle—the first being general in damp places in ordinary soil; but the second affecting decomposing sandstones, especially those associated with the coal formation. *Bromus mollis* is a too frequent annual, especially in upland pastures. It is a poor grass, which takes possession of the soil to the exclusion of better kinds.

The *B. erectus* is quite an inhabitant of limestones; and from its freedom of growth, and not bad-looking culms and flowers, its herbage might readily be mistaken for something good, until a closer examination shows us that sheep and cattle only feed upon it when folded in a limited space; in fact, they must be starved to it, and then it is only second to starvation for them to be obliged to live upon it. Still this treatment is for the good of a pasture where it occurs, as this method of manuring rapidly discourages its growth, when the better kinds proportionably increase.

The *Avena pubescens* affects light upland pastures, in which its young math is not unwholesome; but its culms add but little to the weight of the rick, and that little is, as farmers say, wanting in "proof."

From these remarks we see that even grasses themselves may be of the nature of weeds in pasture; but it fortunately happens that all these are discouraged by good treatment of the meadows on which they occur. So that, in fact, good and bad grasses are always in antagonism; for though they are nearly always present in the same field, a good condition of soil will reduce the bad grasses to a scarcely perceptible minority: only, however, let it get out of condition, and the good will die out before the advance of the poorer kinds.

THE USES OF STRAW.

The economic uses of straw are manifold; but we believe that there are many applications of the culms of grasses, and the leaves of trees, &c., that are little known generally, and their importance quite unappreciated in consequence. The uses of straw for litter and for feeding, for thatch and for brickmaking, as a packing material and for stuffing palliases, are of course generally known. Straw has also been again brought extensively into use of late years as a paper material. Buckwheat straw has been used for dyeing yellow. We do not use straw-shoes for our horses, nor for our own pedal extremities, as they do in Japan; but we do use straw for making hats and bonnets, and that to a much larger extent than many are at all aware of. Few probably could have supposed that the straw plait manufacture, carried on in one or two towns in the home counties, gives employment to 80,000 or 90,000 persons, chiefly females, and is valued annually at one million and a-half sterling. And yet these and many

other important facts connected with this large and growing manufacture are elicited from a paper on the "Straw Plait Trade," recently read before the Society of Arts, by Mr. A. J. Tansley, of Luton. Some of the main facts stated, with others indirectly connected with the subject, we think it desirable to place before our readers for general reference.

Bedfordshire has long been celebrated for the production of beautiful wheat straws, suitable for the purposes of plaiting. The first straws used for the making of plait in this country were grown in the neighbourhood of Luton. Straw-growing now extends throughout the southern part of the country, in the valleys and along the slopes of the Chiltern hills, and also in parts of Hertfordshire, Buckinghamshire, Oxfordshire, and Berkshire. The best soils are light but rich; the stiff clays, being unsuitable, will not produce good straws. Some soils that would produce good straws, but not yield a fair crop of wheat, are only cultivated for the

latter, but those yielding both prove very advantageous to the farmer. The seed used is either that known as red lammas or white chittim wheat, according to soil and aspect, and is sown broadcast, or drilled, according to circumstances, and cultivation is carried on in the usual manner. When harvest draws nigh, great care is required by the grower, it being necessary to commence cutting before the flag of the straw falls. If very wet and stormy weather sets in, the straws become rusted or spotted; or, if the opposite weather, dry and hot, and the crop remains uncut, the straws change red and become harsh. The first favourable opportunity is taken, extra hands are set on, the crop is rapidly cut, laid out to dry before being tied into sheaves, carted and stacked with all despatch as soon as ready. The result of this attention is in general seen in obtaining bright and clear straws that will pay the farmer for all his trouble. An acre of wheat will yield in a good season five to eight loads of wheat, of five bushels to the load, and from fifteen hundred to a ton of cut straws, of the value of six to eight pounds sterling the ton, clear of all expenses. At the present time the price is double, owing to the past wet and stormy summer, good straws being so scarce, many of the best growers, with all their care, having lost their crops.

The farmer disposes of his straw to men known as straw factors; these draw and cut the straws in his barn. Each sheaf is taken between the knees, and the straws are drawn out a handful at a time; the ears are then cut off, and carefully laid together on one side. After a sufficient number have been drawn and cut, large bundles are formed, weighing 20 to 25 lbs., and these are carted to the home of the factor, to undergo another "cutting" process, which is generally performed by boys, who earn from 2s. to 5s. per week. In the act of cutting each straw, the sheath in which it is encased is taken off. Two joints of the straw are preserved for plaiting; the other, or root joint, is cast away.

There are straw-growing districts in Essex, but as the soil is unfavourable for the growth of good straws, great quantities are sent there to be made into plaits from Bedfordshire and other districts.

The growth and preparation of straws is a most important branch of the "straw trade," and to the attention given to it during the last fifty years much of the excellency of English-made plaits is to be attributed. The districts were originally limited, but the advantages of straw-growing has led to the present large extension of the districts in the counties enumerated, the possibility of obtaining a good crop of wheat, with a good crop of straw, having led on many a farmer to their successful cultivation.

So many novelties in straw plait have been introduced of late years by the trade, that Tuscan bonnets have declined as articles of wear—the beauty of English straw plait, as displayed in the new patterns, leading the public to give them the preference. And, although

the reduction and subsequent abolition of the duties on foreign Tuscan has brought that article into competition with the English straw manufacturer, no injury has been sustained by the straw trade. Tuscan is chiefly confined to girls' hats at the present time, and its low price since the removal of the duty has completely abolished the making of English Tuscan from Italian straws.

At the Exhibition of 1851, the skill of the English plaiter was fully shown, and since that date plaiting has continued to progress, not so much in the invention of a number of new plaits, as in the superior quality and extent of the manufacture. The newest feature is the production of various coloured plaits of excellent patterns, suitable for ladies' hats, the last and popular colours being produced in mixed and dried plaits, as mauve, magenta, &c. Many valuable patterns have been made by mixing rice straw with dyed straw, as rice and black, rice and mauve, rice, black, and brown, and similar patterns.

The progress made in English plaiting, up to the present time, has been remarkable in the varieties produced to meet the public taste and the necessities of the million. And although foreign straw plaits from Belgium, Germany, and Switzerland, have been brought to compete with them, they have nearly all failed in this respect. A few single plaits of a choice character are used for white goods, but the greater portion, from the inferiority of their colour, are only suitable for dyeing purposes. Straw plait is a domestic manufacture, carried on in the cottages of the agricultural labourers of the three counties of Bedfordshire, Hertfordshire, and Buckinghamshire, and portions of Essex and Suffolk. The plaiters are the wives and children of the labourers; only a few are men. No plait is made in factories.

The trade of Luton, and the straw plait trade generally in England, is assuming greater importance every year. At present, in all its numerous ramifications, it is most extensive, and when the bonnets and hats made in London are added, the annual returns will not fall short of £1,250,000. During the past fifteen years a large shipping trade has been carried on, chiefly, in the first instance, with the United States of America; later, in addition to this, large quantities of English straw goods are shipped to Canada, the West Indies, and Brazil, and to the continent. While France supplies England with her newest fashions in bonnets, she in return is supplied with the latest fashions in hats from England.

But, while this straw plait trade has been shown to be of importance here, it is almost of equal importance in several of the States of Europe. France, Belgium, and Switzerland carry on an extensive business, chiefly for local consumption. In the Black Forest straw plaiting occupies a large number of persons. In Italy the annual value of the production is over one million sterling. As it was in Venetian Lom-

bardy and Tuscany that this manufacture long centred, it will be interesting to see what was the system pursued there as compared with our English mode of culture and preparation.

The seed from which the straw for plaiting is grown is a small round grain of wheat, called "grano narzolanò," the *Triticum turgidum*, a variety of bearded wheat, which seems to differ in no respect from the spring wheat grown in the Vale of Evesham and other parts of England. It is an error to suppose that hats are made there from rye, or any other than wheat straw. The upper joint of the straw is that chiefly used for plaiting. This straw is grown chiefly in the vicinity of Florence and on the hills on both sides of the valley of the Arno. The straw is pulled while the ear is in a soft milky state, the corn having been sown very close, and consequently produced in a thin, short, and dwindling condition. It is then dried by spreading it thinly upon the ground in fine hot weather, and afterwards tied up in bundles and stacked, for the purpose of enabling the heat of the mow to drive off any remaining moisture. After remaining in the mow for about a month, it is spread out in a meadow, and exposed to the action of dew, sun, and air, in order to bleach it. The straw is frequently turned during this operation; and after it is completed, the lower joint of the straw is pulled off, leaving the upper joint, with the ears attached to it, for use. This part is then subjected to the action of steam, and to fumigation with sulphur, in order to complete the bleaching; after which it is ready for use, and is tied up in bundles. The Italians do not obtain both the grain and straw as we do.

Plaiting of straws, grasses, and chips into hats and different articles of wear, is far from being confined to Europe or to civilized countries. The art is indeed found to obtain, in different degrees of extent and excellence, in nearly every part of the world. In the southern provinces of China, where in summer the population use no other head covering, and where the mandarins wear those umbrella hats with tremendously wide brims, the quantity of straw plaited is prodigious. In Japan, in proportion to the population, the consumption is almost equally great. "When on a journey," says Thunberg, "all the Japanese wear a conical hat, made of a species of grass plaited and tied with a string." He also observed that all the fishermen wear hats of the same material and shape. But in addition to this extensive use, the Japanese hardly ever wear any shoes or slippers but such as are made of plaited straw. "This," remarks the same excellent traveller, "is the most shabby and indifferent part of their dress, and yet in equal use with the high and the low, the rich and the poor. They are made of rice-straw plaited, and by no means strong. They cost, however, a mere trifle; they are found exposed for sale in every town and in every village, and the pedestrian supplies himself with new shoes as he goes along, while the more provident man always carries two or three pair with

him for use, throwing them away as they wear out. Old worn-out shoes of this description are found lying everywhere by the sides of the roads, especially near rivulets, where travellers, on changing their shoes, have an opportunity at the same time of washing their feet. In very wet weather they use wooden clogs, which are attached to their straw-plaited shoes by ties also made of straw-plait. People of very high rank sometimes wear slippers made of fine slips of rattan neatly plaited."

From the leaves of the cocoa and palm, on the Seychilles, hats are manufactured of a superior quality, which are worn in the islands by all classes of inhabitants. The dwarf fen palm (*Chamærops humilis*) is largely used for making hats, for the seats of chairs, thatch, and is converted into paper and paste-board. The leaves of another short palm (*Thrinax argentea*) furnish the chip which is woven into hats and made into baskets and wicker-work. The Panama hats, so much appreciated, and generally worn in Central America, the Southern States, and the West Indies, are plaited from the leaves stripped from off the *Carludorica palmata*, in the Isthmus States and in New Granada. They are distinguished from all others by consisting of only a single piece, and by their lightness and flexibility. They may be rolled and put in the pocket without injury, and may be washed and bleached repeatedly. According to the quality of the hats, more or less time is occupied in their completion; the coarser ones may be finished in two or three days, the finest take as many months to plait. During the year 1852, 10,000 dozen of Panama hats, valued at £60,000, were imported from Catacaos, Peru. In 1856, 261,324 of these hats were exported from Panama, of the average value of 6s. each, but some have been sold as high as £20 or £30 each. Palm leaf fibre is sold in Brazil in bundles of sixty leaves at about 16s. the bundle. Palm leaves, in bundles of about 1 cwt. each, are imported into Liverpool from Cuba, to the extent of more than 600 tons per annum, and are used by hat manufacturers at St. Albans. The price ranges from £10 to £30 per ton.

The leaves of the cabbage palm are used in Australia for making the cabbage-tree hats; but the palm is likely to be worn out with the cedar of the country, and timely measures should be taken for its cultivation. The young tree is still to be found in many of the gullies to the southward of Sidney.

The aloe, abaca, manila, and other fibres, have obtained by a peculiar mode of preparation all the softness of silk, and are now much used for bonnets on the continent, allowing, as they do, of all imaginable patterns of open-work embroidery. The stitches form a tissue, flexible, strong, and very light, and they have the appearance of lace. The bonnets may be cleaned any number of times: they admit of all the transformations required by the changes of fashion, and will dye any colour.

Insignificant, therefore, as these minor agricultural and manufacturing products may seem, they mount up in the aggregate to a very considerable trade, and give profitable employment to large numbers. Straw

has frequently been considered the emblem of worthlessness; but skill, ingenuity, and taste may vastly enhance its economic value, and convert it from a waste product to an important article of commerce.

THE FARM-SERVANT.

This is essentially an age of progress. Every year that passes over our heads sees the world becoming wiser and more experienced in the arts both of war and peace, and adds item after item to our huge catalogue of national lore. The nineteenth century has beheld the rise and development of that huge railway system which has now extended itself in all its varied ramifications through the length and breadth of the land, and has long since begun to form an important moiety in our financial economy. The nineteenth century has seen the very lightning—once considered intractable—once, practically speaking, despised as useless, even to a proverb—subdued by the strong hand of science, and made to fly to the uttermost parts of the earth in a moment at the beck of man, defying the otherwise insuperable barriers of distance, and heralding the rapid progress of that universal civilization which soon, we trust, is to hold the vast expanse of the habitable world in its firm though kindly grasp.

And how with education—how with the social and moral amelioration of the *masses* all this time? Have they made advances at all proportioned to their increased facilities and multiplied advantages? We fear not. We fear that the minds of men have been so engrossed with the consideration of abstruse and scientific subjects, that they have become almost oblivious of, or indifferent to the vast amount of ignorance, aye, and something far worse than that too, which at present prevails among the humbler inhabitants of our leading agricultural districts—that they have begun to “despise the day of small things.”

We might extend our observations to almost all the lower orders of the community, whether belonging to the artizan or the agricultural classes, though, for obvious reasons, we confine ourselves in the present paper entirely to the latter.

Look at that strange specimen of humanity who slowly and listlessly plods along that narrow lane. His eyes are lighted up with no single spark of intellectual fire; his forehead is low, and expressive of the most abject, most hopeless stupidity; while his widely-opened mouth, and shuffling, careless gait bespeak either stolid indifference or brutish sensuality. He belongs to that long-neglected class commonly known as “farm” or “agricultural labourers”—utterly indispensable to the community of which he forms so humble a member, yet, at the same time, alas! too frequently looked down upon by those very persons who ought to be his warmest, most stanch patrons and supporters. Perhaps you are inclined to think that he is almost

beyond the reach of any intellectual improvement, and that it would be scarcely worth your while to take any decided steps in his behalf. If this be the case, our experience in this respect differs materially from yours. We have seen the farm-servant visited at his daily work and in the retirement of his cottage, and invited to become a regular attendant of that most admirable of rustic institutions—the *evening school*. Many a time have we presided over those well-filled forms, and have watched with the deepest interest the effects of our simple training on the uncultivated intellects committed to our care. We have been careful never to weary our rustic scholars by imposing tasks upon them which they have neither the ability nor the inclination to fulfil; still more do we endeavour to confine our tuition to those elementary branches of instruction which, like reading, writing, and arithmetic, are strictly *practical*, and are adapted to meet the requirements of every-day life. And what has been the result? Why, we have had the unspeakable pleasure of seeing our arduous labours appreciated and our simple precepts improved; we have seen our pupils making marked and rapid progress along the great highway of social improvement; we have seen more than one rustic eye moistened with a tear of joy as the plough-boy has felt that he is no longer an object of utter indifference to the cold world around him; and, above all, we have seen the once-stupid, clownish farmer's lad gradually rise from his former state of almost brutish ignorance, till at last he becomes not only a *useful* but an *important* member of society, and after the lapse of years, in a letter to his benefactor, declares that he “owes everything to the *evening school*.”

Nor have our exertions been confined to the above-mentioned institution alone. The claims of the “lending library,” or the plain lecture on some popular and instructive subject, have not been overlooked, and have ever been attended with like success. Is not this something which we have a right to be proud of?

Farmers! a word with you ere we draw this paper to a close. Do you think that the foregoing remarks cannot possibly concern you? If so, you are greatly mistaken. It is true, you may not have time or influence enough to *originate* a lending-library or an evening-school; but then, if you cannot originate, you can at least *countenance* and *support* such laudable institutions, and in your intercourse with your farm-servants you can show that you are not altogether indifferent to their social, moral, or religious amelioration.

G. E. H.

THE VALUE OF STRAW AS FOOD.

We recently drew the attention of our readers to a consideration of the value of straw as food; and in now continuing our remarks on this subject, we may state, that although there is a great disparity between the organic analyses of wheat-straw as made by Dr. Sprengel and those by Mr. Nesbit, we are quite disposed to place the greater confidence in the more recent analyses given by the latter chemist. It must, however, be admitted that we very much need a series of organic analyses of farm-produce, conducted upon well-selected specimens grown under different circumstances as regards climate, soil, and manure. From those offered us by Mr. Nesbit, we may consider wheat-straw to consist of

Albuminous matter ..	..	..	3.5
Carbonaceous matter ..	..	..	10.0
Available as food ..	..	..	13.5
Per cent.			
Ash			6.0
Woody fibre			80.5
Not available as food ..	..	..	86.5
100.			

This shows the proportion of good wheat-straw which is available for food, as distinguished from that which cannot contribute to the support of life. We may now inquire into the real market-value of this nutriment which is contained in the straw. Various methods for calculating the market-value of food have been introduced; but that suggested by Mr. Spooner, at the Blandford Farmers' Club, is as correct and simple as any. For reasons which cannot here be gone into, he calculates

Albuminous matter worth £20 per ton.	
Oil ..	20
Starch, or dextrin ..	12
Mineral matter ..	5

Upon applying these multiples to the analysis, we have the following result:

	Per cent.	£	£	s.	d.
Albumen ...	3.5 × 20 =	70	0	0	
Oil ..	0.84 × 20 =	1	13	7	
Dextrin ...	9.16 × 12 =	109	16	5	
Ash ...	5.0 × 5 =	25	0	0	

£206 10 0 for 100 tons;

or about £2 per ton as the feeding value.

This result very closely approximates to the value put upon straw by those who have used it as food with great care, and closely calculated the results obtained from it; and their conclusions are thus far worthy of our full acceptance, namely, that the value of the nutriment in superior quality of straw may be taken at £2 per ton.

Food differs very much in the results it produces, ac-

cording to the mode in which it is used. The support of the body, in a healthy state, requires a certain amount of food which produces no profitable result; in fact, gives no return for the food eaten. Thus, if by the use of oilcake we were to give to an animal just sufficient nutriment to meet the waste of the body, it is clear that no remunerative return would be gained by its use, and yet the value of the oilcake as a food would remain the same; for it is *the mode of using it* which has rendered it productive of little or no advantage. It is the same with any other food, *whatever its value* (for it may be so employed as to nullify that value); still we must distinguish between its worth for feeding purposes and the result we gain by our mode of using it. It is in this way that there is such a difference of opinion amongst practical men as to the value of straw as food. We know that if cattle are kept upon straw, unless it is of unusual quality and very freely supplied, the stock will fall off in condition; and probably after several tons have been consumed, the stock will be actually lighter than before they ate the straw. This does not in the least degree contradict the fact that so many pounds' worth of straw has been eaten, for it would have been the same with any other food. It is too often forgotten that no animal can be kept alive without consuming food for which no return is made except the maintenance of health; and it is, in fact, a *health-tax*. If you only supply enough to pay this tax, it is all outlay without any return—the food is sacrificed; but if you supply food more liberally, the residue over and above that required for this tax is added to the body, and assumes a profitable form. A given quantity of food supplied in any given time, and which is just equal to the support of life, without adding to the weight of the animal, would, if given in half that time, not only support its life, but also add to its weight. For this reason, the more rapidly an animal can consume a given quantity of nutriment, without prejudice to its health, the more fully will the flesh-forming power of that food be rendered available. It would therefore appear from these facts that in order for straw to manifest its fattening properties, and give evidence of its powers, it should be more freely consumed; and no doubt, if this could be done, it would, like any other standard food, produce fat in proportion to the fat-forming materials it contains. But this increase of supply *cannot* be made, because it is such a bulky food, that when the animal has consumed as much as it possibly can, it does not get, in the food, more nourishment than is necessary to pay the health tax. Those who have seen cattle in yards, with nothing but straw to eat, must have observed how very much their

stomachs become distended,; as if the animals did all they could to take in the largest possible quantity of this bulky food, because of the diffused state in which its nutritive matter exists in it. It is therefore evident that *the bulky character of straw prevents the fattening properties which it contains being taken advantage of, when it forms the only food of the animal*; and hence it is considered by many to be of very low value as food.

The supply of nourishment is not the only consideration which regulates the progress of the animal; for it is quite possible to give this to the beast in a highly concentrated form, and yet for want of sufficient bulk it will not benefit the animal consuming it. If we gave a bullock or sheep just as much oilcake or corn as would be equal to the nutriment contained in that quantity of straw which is sufficient for the support of the animal, we should find it pine away, not from a deficiency of nutriment, but because it has been supplied in a form which prevents him making a proper use of it. *The bulk of the food must be proportioned to the capacity of the stomach.* In order that digestion may be properly carried out, the stomach must be sufficiently filled, to excite the coats of this receptacle to throw out the gastric juice, which is the chief digestive agent. In the horse the stomach is small, and hence a stronger and more concentrated description of food may be employed; but with sheep and cattle the stomachs are considerably larger, and this must be met by the use of a more bulky class of food. The special requirements of the animal system must be complied with, and it is when these conditions are combined that food acts beneficially.

The use of straw as food, whilst valuable on account of its bulky nature and the nutritious elements which it contains, *can only be economically employed*

in conjunction with other food of a more concentrated character. In this way its bulk becomes useful, and the nutriment supplied fully available for the support and development of the animal. We find that those who attach a high value to straw employ it in this manner. Alderman Mechi, who has been amongst the foremost in claiming for straw a much higher value than other practical men generally allow, has stated the manner in which he has gained results proving the nutritive value of straw to be £2 per ton. The instance especially named by him is that of 10 bullocks, which daily received

216	gallons of cut wheat-straw,
6	" rape-cake,
3	" malt combs,
5	" bran,
20	" hot water,
300	pounds of mangel-wurzel.

In this mixture we find the nutritious powers of the cake, malt combs, and bran diffused throughout a large bulk of food in the proportion of 35 to 1, and thus all the advantage of bulk is gained, combined with the supply of nutriment. The general estimation of straw (apart from any consideration of the influence of soil, climate, and ripeness) will be found to vary according to the degree in which its bulky character is taken advantage of, for the distribution of more concentrated food amongst it. The feeder who keeps his stock upon straw alone, estimates its value lower than anyone else; he who gives roots in conjunction with straw thinks better of it; but he who uses it with stronger and more concentrated material will realize the best results, and estimate it at the highest rate. It still remains for us to show to what extent these remarks must be qualified, in consequence of the varying circumstances by which they may be influenced.

THE VETERINARIAN AND HIS VALUE.

It is satisfactory to see that veterinary science is still progressing. Our own Royal College in London flourishes. There are now two such Institutions in Edinburgh, and a hearty endeavour is being made to establish a similar Society in Dublin. With the opening of the new year we have the development of fresh energy, and a certain promise for the future, well grounded on the experience of the past. This is everywhere observable. The Veterinary Art is taking higher ground. It was only during last autumn that we had to dwell upon the fact as demonstrated in the inaugural address of Professor Spooner. This is further corroborated by the opening paper in the January number of the *Edinburgh Veterinary Review*; where Professor Gamgee, engaged in the performance of a like duty, is yet more anxious to impress upon his pupils the necessity of maintaining their fitting position in society. The very title given to the address, "The Relations of Veterinary to Social Science," turns the mind at once to the point. It will be only the unthinking that will henceforth speak of "the horse doctor" with anything of that contempt once so common. Our own immediate health and welfare will teach us to regard him with increasing respect; for veterinary science stands not merely second to the study of medicine "proper," but the two kindred arts have often a direct bearing one on the other. Mr. Gamgee is able and eloquent in his argument, but he especially enforces this by example. We all know the frightful consequences that occasionally arise by inoculation from a glandered horse; but the Professor proceeds to some further illustration of the same dan-

ger of contagion between man and beast not so well known, and that may be profitably reproduced here:—"That there are many unsuspected sources of disease in man, from the prevalence of disease in animals, is often suggested, but positive facts are with difficulty obtained. I must illustrate my meaning. In different parts of England, Scotland, and Ireland, cattle are subject to anthrax, commonly known as quarter-evil, or by the more ludicrous epithet 'black leg.' We have to thank our northern latitude for the rare development, in these cases, of the virulent anthrax poison, which destroys many human beings in warm climates. So destructive is this poison, that flies resting on the carcasses of animals that have died of this disease, or even on the parts affected in the living animal, may fly on to a man's face or hand, induce malignant pustule, and death in a short time. Though such accidents are doubtless extremely rare amongst us, we must not take it for granted that they do not occur. Dr. Keith of Aberdeen related a case to me where disease and death spread through the family of a man who dressed a carcass of an ox that had died of quarter-ill; and had we better means of collecting information on these subjects, many similar instances would doubtless come to our knowledge."

Such cautions cannot be too widely disseminated, while the agricultural population would seem, of all others, to be the most open to any such evil influence. As, for another example: "A cutaneous disease of very common occurrence in cattle, and which generally receives the name of ringworm, is a pustular eruption communicable to man; and I

have often seen bad boils—a furunculoid eruption—on the hands and arms of those attending these animals, which has led to considerable indisposition, and been difficult to cure." The herdsman is still the Professor's care, and never perhaps has the association between agriculture and veterinary science been so forcibly shown as in these important "cases." Let us go on to another: "Again, I may mention the vesicular murrain so prevalent in cows, attended with the development of a virus, which is often squeezed into the milk-can as the cow is milked. Such milk, drunk warm, will kill calves and pigs, and induce fever and cutaneous eruptions in men. Why shall it not be attended with dangerous and fatal consequences when partaken of by the infantile portion of the population, which consumes so large a quantity of the dairy produce?" The whole people, however, is as directly concerned, and rarely has the criminality of offering diseased meat for sale as human food been so strongly impressed. Let us take one more warning fact of how the veterinary surgeon's inspection may save the attendance of our own good doctor: "Of late years considerable interest has been excited by the metamorphoses of parasites. In a piece of pork a few yellow specks or transparent vesicles, which do not appear of the slightest importance, may in reality be tapeworms in one stage of development, for the destruction of which we have to hope for prolonged boiling or efficient roasting. If the meat be eaten underdone, a parasite at once develops in the human intestine, which it sometimes baffles human skill to displace." The general deduction is not favourable to the recognized position that Veterinary Science has even now in this country. There are few such facilities for observation or public appointments offered the veterinarian as those the duly qualified medical man has so long enjoyed. "Veterinarians are debarred from these privileges. They cannot be debarred for long, as their services are urgently required. In France, Germany, and elsewhere, civil appointments exist for veterinarians; and by a satisfactory system of inspection, epizootic and contagious diseases cannot exist long without due attention being paid to them, and measures, often adequate to check the disease, being adopted. There veterinary surgeons hold also positions as inspectors of slaughter-houses; and I can state, from personal experience of the class of men appointed to these offices, that they become very acute observers of diseased conditions, and frequently prevent the sale of food unfit for consumption by man."

No one will question but that the Art of Veterinary Me-

dicine is progressing while it has so able an advocate as we find at the head of a school in Edinburgh to maintain its cause. The point just at present is rather with ourselves. Do we give the veterinary surgeon such support as he should have? Does the Government do anything to encourage him, or to ratify his proper position before the world? Or, above all, do we really consult or employ him sufficiently for the absolute good of the public? By Mr. Gamgee's showing, it would certainly seem not. In Edinburgh such market inspectors as are appointed are generally "fleshers" or butchers—persons "rather disqualified than rendered fit for the office, being accustomed to certain practices peculiar to such trade, which almost precludes their having a strict and unprejudiced notion of what is really lawful and justifiable, and what is not." Beyond even this, we may go on to cite their actual ignorance of the first symptoms of dangerous disease; so that the office becomes practically but little more than useless; while the able veterinarian has to fight his way without a helping hand, when he could give so much in return. The citizens of Edinburgh may certainly be gratified by the knowledge that "most of the bad carcasses are trucked to London;" but what shall we say for London itself? "As a student of the Veterinary College I wandered about the London dairies, and saw the disgusting practices incidental to the sale and consumption of diseased cows: how the most filthy products of disease were hashed up with other meat, equally unsightly and unpalatable, to make sausages; how a lot of the carcasses of cows were polished and dressed up with the fat of two or three young fat bullocks killed with them; and how the flesh of diseased animals not only found its way to the poor man's home, but to the table of the middle and upper classes."

Surely, this state of things cannot be suffered to continue much longer? Are we to ignore the aid that stands so ready to our call, and still look on the veterinarian merely by what he can do for lame horses or hove oxen. There was a time when the horse alone was thought to be his care, and the cattle doctor was the village farrier who killed or cured cows and pigs as chance would have it. This step, however, has been achieved, and there are others which must follow. It has been rarely indeed that we have read a more suggestive address than that recently delivered at the New Edinburgh Veterinary College. It claims a status for the veterinary surgeon on the highest possible grounds—the common good; and it must be our common care to see, in the words of the poet, that the professor

"Has had his claim allowed."

THE MANURE TRADE OF THE PAST YEAR.

From the annual circulars of the principal manure dealers and manufacturers, and the incidental notices as to supplies and freights furnished in the shipping circulars, coupled with the special reports published from time to time in our columns, we are enabled to take a retrospect of the trade in fertilizers for the past year, as well as of the progress and prospects. The growing importance of this trade to an agricultural country like England must be evident to the most superficial observer, and the money value of the products, and the large employment it gives to tonnage, manufactures, and labour, invest it with a degree of interest which every year becomes greater. The food of the soil is subordinate only to the food of the live stock and the people, which is obtained therefrom.

Commencing with the most important of the fertilizers, guano, we may premise that, since 1842, the firm of Messrs. Anthony Gibbs and Sons have held

from the Peruvian Government the contracts for Europe, and for several years also for France and her colonial possessions, Bourbon, Martinique, and Guadaloupe. The present contracts with Messrs. Gibbs expire at the end of this year, after which the business will be conducted by the following houses: For Great Britain and her Colonies, Messrs. Zaracondegui and Co.; for France, Messrs. Thomas, Le Chambre, and Co.; for Belgium, Messrs. Sesciau and Co.; for Germany, Messrs. Witt and Schutte; for Holland, Messrs. Canevaro, Pardo, and Barron; for Italy, Mr. Lazaro Patroni.

Guano freights ruled between 50s. and 65s. last year against 45s. to 60s. in 1859. By the centralizing which has existed, tonnage has been obtained upon the most favourable terms, all competition being destroyed, but by the new arrangements which divide the business between six different firms, the shipping interest is likely to profit considerably at the expense of the Pe-

ruvian Government. From the annual circular of Messrs. Seymour, Peacock, and Co., we glean the following particulars: According to the published documents, no guano can be taken from the Islands by the new contractors until December, 1861; the exclusive sales will therefore remain in the hands of the present contractors until about May, 1862. The consumption has considerably declined during the last few years, the sales in Great Britain having been 214,707 tons from July 1855 to June 1856, and but 149,000 tons between July 1859 and June 1860. In Belgium, during the same periods, the consumption declined from 54,987 tons to about 35,000 tons; in Germany from 33,994 tons to about 23,000 tons. The only places supplied under the general guano charter in which there has been an increased consumption are Holland and the North of Europe; but, allowing for this, the total sales exhibit a decline of no less than 90,000 tons. On the other hand, the stocks have accumulated, and it is estimated that there is now in store, afloat, and tonnage engaged, sufficient to supply more than the demand for the article up to the expiration of the contract, unless an increased consumption alters the basis of our calculations. The import of guano for the first eleven months of last year was 108,594 tons, against 78,651 tons for the same period in 1859, and 309,557 tons in 1858.

In Scotland artificial manures are most extensively used, and 1860 having been a very prosperous year for the farmer there, this will no doubt encourage their use. In a recent statistical paper of the Highland Society, it is estimated that £4,250,000 is annually expended in portable manures, of which guano forms the large item of £2,500,000.

The imports of guano into the Clyde last year were 11,918 tons against 5,633 tons in 1859, and the present stock on hand is 4,568 tons of all kinds against 2,830 tons at the same period last year. The consumption there goes on steadily, and prices have undergone no change. The great difference in the relative value of Peruvian and the lower qualities indicates the strong bias in favour of the former. The annual export from the Chinchas is now believed to exceed 400,000 tons; so that at this rate the continuance of supply becomes a matter of deep interest. The imports from other deposits have fallen off greatly of late years, and the low prices ruling in Great Britain in comparison with those in the United States and sugar-growing countries will tend to divert the supply from this country. The stocks of Peruvian throughout the various ports are about the average of former years, but of the other sorts they are much less.

Mr. J. F. Boyd, in his "Review of the Trade in Manures during 1860," states that Peruvian guano is going out of favour in some parts of the country. It is said to "exhaust" the land. There will probably, however, be a good demand for it, and perhaps also for really first-class corn manures this spring, very little wheat having been sown last autumn. He adds the remark that the theories of agricultural chemists are by no means always in accordance with the observations of practical men. Manufacturers ought patiently to devote more attention to the collection and systematizing of facts in relation to all the efforts of the different fertilizers on different soils, with a view to a closer correspondence between theory and practice, and the consequent improved composition and preparation of their goods.

The use of coprolites, according to one dealer, has been diminishing, the superiority of bone over mineral manures being almost universally felt. The now prevalent practice of requiring an analysis has rendered it incumbent on manufacturers to use less coprolites. Another firm states, that being still the cheapest source

of phosphates, a large trade has been done in them, and some new pits have been opened in Cambridgeshire. Many manufacturers have found the advantage of adding about one per cent. of ammonia to their superphosphate, whether the latter be made from bones or coprolites, or both. Coprolites are a little higher in price than last January. The demand, languid during the greater part of the year, became brisk after the rise in bones. The value of phosphates, either in guano or bones, is now more appreciated, too much ammonia being rather stimulating than permanent.

The circular of the London Manure Company states that there is a growing desire to have manures of high quality, more especially in superphosphate of lime, and the use of bones and bone-ash in its manufacture is considerably greater than in former years. In the early part of last year the market was well supplied with raw material, both bones and bone-ash, but the increased demand during the last three months has caused a considerable rise, which will probably be maintained for the present season. The imports of bones from the River Plate last year were short. The imports into Hull from the Continent were also 7,767 tons less than in 1859, and 2,543 tons less than the average import of the previous five years. This short import arose partly from the large importation of grain, which engrossed freights. The stock held in Hull is about 1,800 tons of bones, and 1,000 tons bone-ash.

The total imports of bones and bone-ash last year were only 55,540 tons against 73,946 in 1859. And yet bones are yearly getting into more favour. In London there are only small parcels of town-collected to be had, and the whole of the east coast must depend on this description for some months. A demand having sprung up in the United States, many cargoes were directed there, which has caused an advance of 30 to 50 per cent. This market has been quite cleared of bones and bone-ash; the stock in Liverpool is small, and there will be no arrivals of consequence in this country for several months. Greater attention, it seems, is now being directed to the improvement of pastures, and probably no money expended on the farm yields a more certain return than the use of bones, and those manures containing phosphates, to exhausted grass-lands.

The United States demand has mainly absorbed the shipments of Sombbrero phosphate. The imports of direct cargoes, which have been suspended for some months, will recommence shortly, and a great deal will necessarily be used this spring. The stock in the market is under 2,000 tons.

The Spanish are coming more into favour; but the anticipations of large supplies of Estramadura phosphates have not yet been realized. It is not likely much will be received until the railway from the neighbourhood of Logroscac to the Tagus is constructed.

The imports of nitrate of soda were 6,000 or 7,000 tons beyond those of 1859, and a decline in price of 2s. 6d. per cwt. has led to increased consumption for manufacturing uses.

Although the Italian revolution for a time interrupted the supplies of sulphur, the imports were only about 5,000 tons below those of 1859. The continuance of high prices has rendered the use of Spanish and Belgian pyrites very general for manure-acid, which has become an immense trade.

While Great Britain was the first to set the example of testing experimentally and proving the value of a due application of artificial manures to the soil, other countries which have watched these results have not been slow to imitate her example. The Continent, the United States and the Colonies are now giving their attention to the very important subject.

TREDEGAR CATTLE SHOW.

This annual gathering took place on Tuesday, Dec. 18, at the flourishing town of Newport, under the auspices of Lord Tredegar, by whose father (the renowned "Ivor Hoel") this excellent and now important society was established some forty years ago. It cannot fail to be gratifying to the present noble lord to notice the great improvements which have been brought about in the agriculture of that portion of the principality since its establishment, comprising as it does a district of almost unexhaustible wealth in mineral productions, much of which is only of recent discovery, and in consequence an enormously increased population has to be provided for. Whilst these have been unceasingly engaged in extracting from the bowels of the earth the valuable minerals contained, the farmer of the district has been equally industrious and persevering in his endeavours to provide for their wants, aided by the liberality of the landed proprietors, with Lord Tredegar at their head—each equally vying in the promotion of agricultural progression. Thus it is we see not only the general character of the stock of the country changed, but large tracts of comparatively valueless land drained and converted into a state of fertility, which, like many of the herds and flocks of the district, bid fair to challenge many more favoured parts of the kingdom. Yet there is much more remains to be done, and therefore it is with sincerity we wish this valuable society good speed, and indeed under such patronage and judicious management it can scarcely do otherwise. When we state that the noble Lord himself not only annually distributes twelve silver cups, but also bears a great portion of the expenses, amounting altogether to the sum of £300, and that his noble example is liberally followed by a large number of other wealthy inhabitants, we cannot doubt it will not only maintain its position of being the principal meeting in Wales, but that it will continue to increase in importance and usefulness. Here our readers will perhaps pardon our digressing for a moment from the subject of our report, to acknowledge our sense of the liberality of Lord Tredegar at his recent rent audit, when, in consideration of the late trying season which all tillers of the soil have had to combat with, his agent received instructions to return the tenantry 10 per cent.

The numerous lists of prizes offered for competition embrace not only distinct prizes for Devons, Shorthorns, and Herefords, open to all England, but also prizes for which each and every breed are open to compete, and then follow prizes limited to the locality for animals bred by and the property of persons resident within 25 miles of Newport. This arrangement certainly brings together what may be termed a motley group, and by the unob-servant some who send may possibly be ridiculed for doing so. But here is the great value of the arrangement, as under the first many superior animals from different parts of the kingdom are brought into competition, and the local farmer who possesses what he considers first-class

stock at home, upon placing them beside the superior bred animal, cannot fail to be struck with a sense of their inferiority, and by such comparison becomes stimulated to effect improvement. Judging from the smallness of the number of Devons, and the inferiority of a large number of the Shorthorns exhibited, and not only the numbers, but the superiority of the Herefords, we are led to the conclusion that they are the race of cattle most adapted for the district. In the Devon classes (for his lordship's prizes) there was only one yearling bull and two heifers shown, all of which were the property of the Hon. G. C. Morgan. The Shorthorn classes suffered in their wonted attraction from the absence of the veteran exhibitor from Broad Hinton (Mr. Stratton), who has often won easy laurels here, but has now been absent two years. In his stead we have representations of the well-known herds of Mr. Hewer (Sevenhampton), Mr. Logan (Mainer), and Mr. Lane (Cirencester)—easy winners; indeed, the yearling bull from the former herd, by Barrowby Lad (12,486), is a choice animal of great size, and very superior quality of flesh. In the Hereford classes Mr. Jones (Llyn-y-gaer) takes the first prize, with a young bull of great substance, good quality of flesh and hair, in a class of seven competitors; and Mr. Taylor (Stretford Court, Leominster) is awarded second for a level, handsome animal—passing from his lordship's premises. In competition with other breeds, this gentleman takes a first prize with a very choice specimen of a Hereford heifer; while Mr. Law's shorthorn receives a high commendation. In the fat cow class the Hereford is again successful, and so for the best pair of two-year-old heifers, the property of Mr. Leyshon (Bridgend, Glamorganshire). In the breeding-cow class, which was one of no ordinary merit, the palm is given to three very superior, heavy-fleshed Herefords, belonging to Mr. Evans (Llandawlais). The next point of interest is a class of fifteen competitors for the prize given for the best bull-calf, and wherein the Hereford of Mr. Jones (Llyn-y-gaer) takes first honours. In the bull cow and offspring class we have four competitors. Mr. Rees Keene (Pencraig) takes first premium with three beautiful animals, and the offspring—an heifer only 8 months 2 weeks old—is awarded the piece of plate value 20 guineas, given by the corporation for the best breeding animal of either sex, exhibited in the yard, limited to the district. In this class Mr. Jones (Llyn-y-gaer) takes second prize with three excellent animals. In the fat cow classes, open to all breeds in the district, Mr. Keene is again singularly and deservedly successful, and so with the steers. We have frequently seen the Herefords carry away many marks of distinction at these meetings, but never remember to have seen them so singularly successful as this year. In the sheep classes we have many animals of superior merit; and we think, had Mr. Sidney been there, he would have formed a more favourable opinion

of the Welsh mountain sheep than that he expressed at Hanover-square last week. The fact is obvious, from the beautiful animals shown by Mr. Richards (Abergavenny), that they have the material in their own hands whereby they can best effect the improvements requisite to suit that bleak, mountainous district. The pigs were a marked improvement upon former years; and some of the horse classes displayed great merit, and would have been more generally appreciated had this portion of the show been better arranged. But the visitors, after winding their way through numerous groups in the spacious markets in search of the animals competing, were as likely to receive a kick from those shown in other classes, or be ridden over by some disappointed competitor—who, anxious to show the superiority of the action of his horse, saddled and mounted him, and rode right amongst the others.

PRIZE LIST.

JUDGES OF CATTLE, SHEEP, AND PIGS.

Mr. E. JONES, Springfield, Hereford.

Mr. C. RANDELL, Chadwell, Evesham.

HORSES.

Mr. D. BROWN, Brecon (assisted by the above)

SILVER CUPS GIVEN BY LORD TREDEGAR.

For the best Yearling Bull, North Devon—Hon. G. C. Morgan, Ruperra Castle, near Newport.

Best Two-year-old Heifer, Devon—Hon. G. C. Morgan.

Best Yearling Bull, Short-horned—Mr. W. Hower, Sevenhampton, Highworth, Wilts.

Best Two-year-old Heifer, Shorthorn—Mr. John Logan, Maindee, Newport.

Best Yearling Bull, Hereford—Mr. John Jones, Llwynygær, near Raglan.

Best Two-year-old Heifer, Hereford—Mr. John E. Hower, jun., Vern House, Hereford.

Best Fat Ox, that has never won a prize—Right Hon. Lord Tredegar.

Best Boar—Mr. J. Llewellyn, Caerphilly; highly commended, Mr. W. Hower; commended, Mr. T. L. Brewer.

Best Fat Pig—Mr. C. Kease, Glewston, Ross; highly commended, Mr. W. Hower; commended, Mr. J. Seys, Graig.

Best Ram Lamb, long-wool—Rev. F. Lewis, Portskewitt, Chepstow; commended, Mr. W. Donne, Monkton, Glamorganshire.

Best Ram Lamb, short-wool—Mr. J. Moore, Pewsey, Wilts; highly commended, Mr. J. Moore; commended, Lord Tredegar.

Best Yearling Cart Colt or Filly, bred by the exhibitor—Mr. Thos. Thomas, St. Hilary, Glamorganshire.

SILVER CUPS GIVEN BY THE SOCIETY.

For the second best Two-years-old Heifer, North Devon—Hon. G. C. Morgan.

Second best Yearling Bull, Shorthorn breed—Rev. W. H. Beever, Cowbridge, Glamorganshire.

Second best Two-year-old Heifer, Shorthorn—Mr. John Lane, Barton Mills, Cirencester.

Second best Yearling Bull, Hereford—Mr. J. Taylor, Stretford Court, Leominster; highly commended, Mr. T. S. Bradstock, Ross; commended, Mr. Warren Evans, Llandowlas.

Best Pen of Six Shearling Ewes, long-wool—Rev. F. Lewis, Portskewitt; highly commended, Mr. R. Leyshon, Bridgend; commended, Mr. C. Kearsey.

Best Pen of Six Shearling Ewes, short-wool—Mr. John Moore.

Best Breeding Sow, with first litter of Pigs—Hon. Frederick Morgan, Tredegar Park; commended, Mr. John Logan.

THE FOLLOWING SILVER CUPS GIVEN BY OTHER GENTLEMEN:

CAPEL HANBURY LEIGH, Esq., Pontypool Park—A Cup,

for the best Yearling Heifer, bred by the exhibitor—Mr. J. Taylor, Stretford Court, Leominster; highly commended, Mr. J. Lane, Barton Mills, Cirencester.

WILLIAM MARK WOOD, Esq.—A Cup, value Five Guineas, for the second best Yearling Heifer—Mr. John Seys, jun., Goldcliff, near Newport.

WILLIAM H. M. STYLE, Esq.—A Cup, for the best Fat Cow—Mr. R. Williams, Brecon; highly commended, Mr. E. M. Curre; commended, Mr. H. Hale, Christchurch.

THOMAS POWELL, Esq., The Gaer.—A Piece of Plate, value Ten Guineas, for the three best Cows, in-milk, or within three months of calving—Mr. W. Evans, Llandowlas; highly commended, Mr. Leyshon, Bridgend; commended, Mr. W. Evans and Mr. T. Edwards.

JAMES RENNIE, Esq., Maindee—A Piece of Plate, for the best pair of two-year-old Heifers, in milk, or within three months of calving—Mr. R. Leyshon, Bridgend; highly commended, Mr. J. Jones, Llwynygær; commended, M. W. Evans and Mr. R. Keene.

REV. AUGUSTUS MORGAN, Machen Rectory—A Cup, for the best Bull, Cow, and Offspring, North Devon breed, bred by and property of the exhibitor. The Cow to be in milk, or within three months of calving—Rev. Augustus Morgan, Machen Rectory, near Newport.

FREDERICK JUSTICE, Esq., Belle Vue—A Cup, for the best pair of Yearling Steers—Mr. John Logan, Maindee, near Newport.

SAMUEL HOMFRAY, Esq., Glen Uske—A Cup, for the best Two-year-old Heifer, bred by the exhibitor, and being his property at the time of showing—Mr. John Lane, Barton Mills, Cirencester; highly commended, Lord Tredegar and John Logan.

WEST OF ENGLAND AND SOUTH WALES DISTRICT BANK—A Cup, value Five Guineas, for the best Bull Calf—Mr. John Jones, Llwynygær; highly commended, Mr. J. Taylor, Stretford Court; commended, Mr. W. Price, Bishton.

D. R. WILLIAMSON, Esq., The Laws, Perthshire—A Cup, for the best Yearling Bull, shorthorn—Mr. J. Lane, Barton Mills, Cirencester; highly commended, Mr. Hower, Highworth, Wilts; commended, J. Logan, Esq.

WILLIAM PHILLIPS, Esq., Whitson House—A Piece of Plate, value Ten Guineas, for the best Bull under two years old—Mr. Henry Hale, Troston Farm, Christchurch, near Newport.

THE MAYOR AND MEMBERS OF THE CORPORATION OF NEWPORT—A Piece of Plate, value Twenty Guineas, for the best Stock Bull, Cow, or Heifer—Mr. Rees Keene, Pencreeg; highly commended, Mr. W. Powell and Mr. W. Evans.

THE RT. HON. LORD LLANOVER—A Cup, for the best Ram, any Welsh Mountain breed—Mr. Matthew Ion, Rhoswen, Bedwelyt.

THE LADY LLANOVER, Llanover Court—A Cup, value Five Guineas, for the best pen of Six Breeding Ewes, any Welsh Mountain breed—Mr. John Richards, Abergavenny.

CAPTAIN GEORGE HOMFRAY Newport.—A Cup, value Five Guineas, for the best pen of Four Mountain Wethers—Mr. Matthew Ion.

OCTAVIUS MORGAN, Esq., M.P., The Friars—A Cup, for the best Boar and Sow, of any breed, under a year old—Mr. W. Hower, Sevenhampton, Highworth, Wilts; commended, Mr. J. Llewellyn, Caerphilly, Glamorganshire.

JOHN LOGAN, Esq., The Maindee—A Cup, value Five Guineas, for the best three-year-old Cart Colt or Filly—Mr. Thomas Rogers, Orecop, Herefordshire.

THOMAS BROWN, Esq., Victoria Park, Ebbw Vale—A Cup, value Ten Guineas, for the four-years-old old Calf Gelding or Filly—No entry.

ADMIRAL RODNEY MUNDY.—A cup, for the best cart mare and foal—Mr. Rees Williams, Pencelly Castle, Brecon.

COLONEL POULLETT SOMERSET, M.P.—A cup, for the best cart stallion—Mr. Thomas T. Davies, Langstone Court Farm, near Newport; highly commended, Mr. Isaac Theyer, Ross.

WILLIAM JONES, Esq., Clytha—A cup, for the best nag mare for general purposes, in foal, or with colt by her side—Mrs. E. Dew, Llanvetherine Court, near Abergavenny; highly commended, Mr. T. Williams, Scethrog, Becon.

[This prize is for the present withheld, the judges having a doubt as to whether the mare is in foal.]

JOHN E. ROLLS, Esq., The Hendre.—A cup, for the best pony under four years old—Mr. David Jenkins, Flemington Court, Cowbridge; highly commended, Mr. Matthew Ion, Rhoswen, Bedwelly.

SOCIETY'S PRIZE.—A cup, for the best cob horse, under six years old, and not exceeding fifteen hands high—Mr. D. Griffiths, Aubrey Arms, Bonvilston, Glamorganshire.

J. P. GWYNNE HOLFORD, Esq., Buckland, Breconshire.—A cup, for the best yearling colt or filly, by a thorough-bred horse (name sire), and bred in Monmouthshire, Glamorganshire, or Breconshire—Lord Tredegar.

THE HON. GODFREY CHARLES MORGAN, M.P.—A cup, for the best three-years-old colt or filly, by a thorough-bred horse, foaled and bred in the county of Monmouth, Glamorgan, or Brecon—Mr. Hugh Eutwistle, Marlborough Grange, Cowbridge; highly commended, S. Homfray, Esq., Glen Usk.

E. M. CURRE, Esq., Itton Court.—A cup, value five guineas, for the best four-year-old colt, filly, or gelding, by a thorough-bred horse, foaled and bred in the county of Monmouth—Mr. Edward J. Smith, Boverton-place, Cowbridge.

G. R. GREENHOW RELPH, Esq., Beech-hill, near Usk.—A cup, for the horse best calculated to get stock suitable for the road or field, and whose head-quarters for the last season were within twelve miles of Usk—Not sufficient merit.

W. S. CARTWRIGHT, Esq., Newport.—A cup, value ten guineas, for the best thorough-bred entire colt, two years old or upwards, bred by and the property of an exhibitor, residing in the counties of Monmouth or Hereford, or the principality of Wales; or for the best thorough-bred stallion at the service of the public in the above district, during the season 1860—Mr. D. Griffiths, Aubrey Arms, Bonvilston, Glamorgan.

THOMAS BROWN, Esq., Victoria Park, Ebbw Vale.—A cup, value ten guineas, for the best hundredweight of cheese, made in the county of Monmouth or Glamorgan—Mr. Charles Hayward, Werndee farm, Bettws, near Newport; commended, Mr. Henry Hale, Christchurch.

CRAWSHAY BAILEY, Esq., M.P.—A cup, value ten guineas, to the tenant farmer in Monmouthshire, not possessing landed property exceeding £300 per annum, for the best root crop, consisting of mangold wurtzel and Swedish or common turnip, in all not less than fifteen acres—Mr. John Dowle, Claypit farm, Chepstow.

W. P. HERRICK, Esq., Beau Manor Park, Leicestershire.—A cup, value five guineas, for the best three acres of mangold wurtzel, grown by a tenant-farmer, whose farm is situated the south side of the road leading from Newport to Chepstow; and if a portion only of a field be exhibited for this prize, the piece so shown, to be measured, through the whole length of the drills in that part of the field which may be selected for competition—Mr. William Baker, St. Bride's, Netherwent.

PRIZES GIVEN BY GENTLEMEN OF NEWPORT AND THE NEIGHBOURHOOD.

A piece of plate, value ten guineas, for the best, and a piece of plate, value five guineas, for the second best bull, cow, and offspring—1st prize, Mr. R. Keene, Pencraeg; 2nd, Mr. J. Jones, Llwynygaer; commended, Mr. Henry Workman, Coed-kernew, and Mrs. Sarah Lewis, Liangibby.

A piece of plate, value ten guineas, for the best, and a piece of plate, value five guineas, for the second best fat cow—1st prize, Mr. Rees Keene; 2nd, Mr. John Jones.

A piece of plate, value ten guineas, for the two best fat cows, fed in the county of Monmouth—Mr. Rees Keene.

A piece of plate, value five guineas, for the two best fat cows, fed on the levels of Caldicot or Wentloog—Mr. Matthew Hale, Cold Harbour, near Newport.

A piece of plate, value ten guineas, for the best, and a piece of plate, value five guineas, for the second best pair of two-years old steers—1st prize, Mr. Rees Keene; 2nd, Mr. W. Williams, Ely, near Cardiff.

A piece of plate, value five guineas, for the best pair of yearling steers, bred and fed by the exhibitor—Mr. James Phillips, Trosteven, near Usk.

A piece of plate, value ten guineas, for the best, and a piece of plate, value five guineas, for the second best pair of yearling stock heifers—1st prize, Mr. W. Powell, White House, Abergavenny; 2nd, Mr. Thomas Edwards, Llanarth; highly commended, Mr. Rees Keene; commended, Mr. Warren Evans, Llandowls.

A piece of plate, value five guineas, for the best pen of four yearling wethers, long wool—No entry.

A piece of plate, value five guineas, for the best pen of four yearling stock ewes, long wool—Mrs. Elizabeth Dew, Llanvetherine Court, near Abergavenny.

A piece of plate, value five guineas, for the best pen of four breeding ewes, under three years old—Mrs. E. Dew.

A piece of plate, value five guineas, for the best pen of four breeding ewes, above three years old—Mr. John Jones.

A piece of plate, value ten guineas, for the best piece (not being less than ten acres) of Swedish turnips, growing within the county of Monmouth—Mr. John Dowle, Claypit Farm, Chepstow.

A piece of plate, value five guineas, for the best piece (not less than five acres) of Swedish turnips, grown by a tenant-farmer, in the county of Monmouth, who does not farm more than 100 acres of arable land—Mr. John Richards, Abergavenny.

A piece of plate, value five guineas, for the best piece (not less than two acres) of mangold wurtzel, grown by a tenant farmer in the county of Monmouth—Mr. Wm. Langley, Lanfair.

A premium of two guineas-and-a-half, for farm servants or labourers, for the longest servitude, uninterruptedly, under the same master, on the same farm, on under the same family—John Smith, servant to Mr. George Pritchard, White House, Raglan, 37 years.

A second premium of one guinea-and-a-half—William Williams, servant to Mr. George Pritchard.

A third premium of one guinea—Thomas Hughes, servant to Mr. Lewis Poliard, Rogiet, 21 years 2 months.

ESSEX AGRICULTURAL SOCIETY.

The annual meeting of this Society was held on Friday, Jan. 4, at Chelmsford. Mr. T. W. Bramstone, M.P., presided, and there was an influential attendance.

The SECRETARY (Mr. R. Emson) read a very satisfactory report and statement of accounts, from which it appeared that a further sum of £200 had been invested in Consols, making a total of £559 stock held by the Society, and leaving a balance of £124 in the treasurer's hands. Every succeeding exhibition of the Society had showed a signal improvement over the preceding; and last year's meeting at Saffron Walden would have reflected credit on any society in the kingdom. The interest felt in it was shown by the fact, that notwithstanding the unfavourable state of the weather, the receipts for admission amounted to £157, while the sums awarded in prizes reached the large total of £518.

Mr. R. B. WINGFIELD BAKER proposed that Sir T. B. Lennard should be elected President for the ensuing year.

The motion was seconded by the Rev. J. Cox, and carried unanimously.

The following gentlemen were also chosen as the Committee:—Northern division: Mr. G. D. Badham, Bulmer; Mr. W. P. Baghurst, Frating Abbey; Mr. J. Clayden, Littlebury; the Rev. J. Cox, Fairstead Rectory; Mr. F. Wiltlock, Yeldham; Mr. J. G. Fenn, Ardleigh; Mr. P. Portway, Sampford; Mr. S. Jonas, Chrishall Grange; Mr. S. Q. Viall, Baythorn Hall; Mr. W. M. Tuffnell, Hatfield House; Mr. E. Catchpool, Feering; Mr. F. H. Shoobridge, Witham. Southern division: Mr. G. Carters, Danbury; Mr. J. Christy, jun., Roxwell; Mr. W. Hart, Blackmore; Mr. T. Kemble, Runwell Hall; Mr. J. Oxley Parker, Woodham Mortimer; Mr. W. Swerder, Stapleford Tawney; Mr. W. Page, jun., Southminster; Mr. T. Wright, Buttsbury; Mr. Charles Sturgeon, The Elms, Gray's; Mr. T. Mashiter, Priests, Romford; Mr. J. Bearblock, Hornchurch Hall; Mr. C. Barnard, Harlow.

Some discussion having taken place in regard to the arrears of subscriptions, and certain alterations having been agreed to in the rules, a vote of thanks was passed to the retiring President, Lord Braybrooke, and a similar compliment having been accorded to the Chairman, the proceedings terminated.

NORFOLK AGRICULTURAL SOCIETY.

The annual meeting of this Society was held on Saturday, Jan. 5, at Norwich. There was a large attendance of the members of the Society, and the proceedings appeared to excite considerable interest. The Rev. P. Gurdon was called to the chair.

The acting Secretary (Mr. E. C. Bailey) read the usual abstract of accounts, from which it appeared that the subscriptions during the past year had been £426 8s.; the subscribers' premiums £65; the receipts at the gate on the day of exhibition £97 15s.; and the total income (including a balance of £199 5s. 1d. at the commencement of the year) £818 0s. 8d. The disbursements had been—premiums £409; silver medals £30 11s.; expenses of exhibition, &c., £87 10s. 4d.; salary of acting Secretary £40; miscellaneous charges £40 18s. 7d.: leaving a balance of £216 0s. 6d.

Mr. CLARE READ congratulated the Society on the state of its finances, and also on its general management. Last year the Society expended £30 more in prizes, and there was still an increase of £17 in the balance in hand. The local public were beginning to appreciate the Society more; for while the receipts at the exhibition at Swaffham in 1851 were only £21 9s. 6d., in 1859 they were £74 7s. 6d. The receipts again at the Norwich show in 1852 were only £37, while in 1860 they were £97 15s. The Society, however, still failed to come quite up to the Suffolk Association as regards the support received from the public; for while Ipswich gave £30, Norwich—the capital of East Anglia—gave nothing; and while the Norfolk Society took £97 at its exhibition, the Suffolk Society, in the little town of Framlingham, collected £275.

Mr. W. BURROUGHS, referring to the election of a president for the ensuing year, stated that an application had been made to the Earl of Orford. In reply, his Lordship wrote: "I am much flattered by your letter, but am so uncertain as to my plans, that I must beg leave to decline the offer." It appeared that his Lordship's health was in such a state that he doubted whether he should be able to fulfil the duties proposed to be assigned to him. Perhaps, however, the noble Lord would be well enough to attend.

It was agreed, after some discussion, to elect his Lordship on the chance of his being able to modify the resolution expressed in his letter.

The next business was the election of members to supply the vacancies in the committee. Mr. Woods proposed that Mr. R. B. Aylmer should take the place of Mr. Barthropp (of Suffolk), disqualified by reason of his not having attended any meeting during the past year. An objection was urged that there were already two members of the Aylmer family on the committee, but Mr. Woods rejoined that they were all good breeders of stock, and pressed his motion, which was carried. Mr. J. HUBSON, of Castleacre, stating that he was now so deaf as to be unable to hear what was going on, his son was elected in his stead. The other retiring members of the committee were re-elected.

The Honorary Secretaries (the Rev. P. Gurdon and Mr. W. Burroughs) were re-elected, and the Acting Secretary (Mr. Bailey) was also re-appointed. Mr. Bailey declined an increase of salary.

Mr. CLARE READ then brought forward a motion of which he had given notice, to the effect that the next annual meeting should be held at East Dereham, instead of Swaffham. Mr. Read said a wish was generally expressed at the Swaffham meeting in 1857, that the Society should try some other locality, and that Dereham should be the place selected. Time had passed on, and no notice had been taken of the matter; but, nevertheless, the present arrangement was attended with much inconvenience to exhibitors of stock. Of course, in olden times, when there was no railroad, and when two societies existed in the county, it was necessary that one of them should hold

its meeting at Swaffham; but under present circumstances—Swaffham being inconveniently situated as regards railway accommodation—he saw no reason why Swaffham should monopolize all the shows in the west. In proposing that the next meeting should be held at Dereham, he had no desire to confine the society's exhibitions to that town, but if the good people of West Norfolk wished it, he had no objection to their shows being held alternately at Swaffham, Dereham, or Fakenham. If one turned to that very flourishing society—the Suffolk—one found that it migrated from one town to the other, the meeting being held every alternate year at Ipswich. He believed persons living in the north, east, and south of Norfolk would prefer Dereham as a place of meeting, and he was sure that the important exhibitors from Suffolk would also prefer that town. The change he proposed could not make any difference except to gentlemen living in the immediate neighbourhood of Swaffham, and he believed Messrs. Brown and Aylmer would not mind sending their sheep a few miles further, as they would be sure to take away prizes to compensate them for their trouble.

Mr. J. SMITH seconded the motion, to which

Mr. Woods moved a direct negative. Mr. Woods said he had the greatest respect for everything which fell from Mr. Read, but he was at a loss to know what had induced that gentleman to bring forward his proposition, and why he had selected Dereham in place of Swaffham, which had greater claims upon the society than even Norwich.

Mr. READ: Oh, yes—no doubt about that.

Mr. WOODS: Then why select Swaffham as the place from which to take the meeting? The Acting Secretary had, he believed, taken great pains to induce the citizens of Norwich to give a cup to the society, but had been obliged to abandon the effort in despair; while the people of Swaffham, on the contrary, had not only given a cup, but were prepared to give a prize of £25, if the meeting was again held in their town. This fact, and the largeness of the receipts at Swaffham, showed that there was much interest felt in the society in the neighbourhood of that town. Mr. Read had not been in the habit of sending sheep to the exhibitions of the society, or he would feel the difficulty and inconvenience of sending sheep twenty miles by road, especially if they had afterwards to be exhibited at the Suffolk show. When the two societies were amalgamated, it was agreed that the meetings should be held alternately at Swaffham and Norwich; and he believed they would be told that they had no power to make the alteration. If any change were made, the meeting should be taken away from Norwich first; for, with the exception of the talented editor of the *Norwich Mercury*, scarcely any of the citizens supported the society, or attended its dinners. The society ought, he contended, to 'stick to where they were stuck to.'

Mr. HAMOND supported Mr. Woods. If the members of the Society wished, he said, to knock the thing up and make a mistake of it altogether, the motion of Mr. Read would achieve such a result. It would have been better if the gentlemen of East Norfolk had chosen a more fitting time to bring the matter forward, viz., when the meeting was about to be held at Norwich; they would then have showed something like anxiety for the well-being of the society; but now the affair took quite another reading. When the two Norfolk societies were amalgamated, the West Norfolk was the stronger of the two; certainly the best attended and most popular; but the amalgamation had been a great advantage to the two divisions of the county, especially to the East, for gentlemen from that district had been enabled to see better long-woolled and better short-woolled sheep than they had ever seen before, and it was better for a man to judge by other peoples' bushels instead of by his own, which was apt to be an extremely fallacious measure (laughter). The subscriptions of the members of the Society being now due,

he contended that the meeting had no power to alter the most essential of the marriage articles between the East and the West. Upon the faith of the present understanding a good many West Norfolk men had joined the Society: and nothing was so injurious to an association of this sort as bad faith. It appeared that the East Norfolk men showed such very moderate stock, that they rarely got prizes to take home with them, and they would prefer, perhaps, to show their animals against those of their neighbours; but he contended that, after all, the prizes should go to those who most deserved them. They wanted to compare bad things with bad things; but it was an immense advantage to show bad things with good things. Allusion had been made to the Suffolk members, who showed almost entirely horses and a pig or two (laughter). Their horses were bred and reared for show, and nothing else, and he did not think a little walking exercise would do them the least harm in the world (laughter).

Mr. READ said he was not at all wedded to East Norfolk, and he should be quite content to see the society meet alternately at Norwich, Swaffham, and Dereham. What the Swaffham people had done, the Dereham people would do for the society, being ready to grant the free use of a piece of ground, and also to give a liberal subscription.

Mr. HAMOND: I live in West Norfolk; I am wedded to my lawful wife; and I don't think anything but Sir Cresswell Cresswell ought to separate us. We have not been through the court yet (laughter).

Mr. READ: We are now in it, I suppose (laughter).

A division was then taken, and there appeared, for Mr. Read's motion, 15; against it, 19. The present arrangement will, therefore, not be disturbed.

The proceedings closed with a vote of thanks to the chairman.

BONE MANURE.

SIR,—You would greatly oblige if you could give an indication to some experiments in the application of ground bones as manure for corn, grass, and green crop. Those comparative effects of steamed *versus* unsteamed bones would be most valuable. Most farmers are still ignorant of the great value of bones as manure.

Yours, &c.,

A CONSTANT READER.

Utterstone.

Bone manure is universally considered one of the best kinds that can be applied to the land, whether for corn, grass, or root crops, and its extensive and increasing use is a proof of the estimation in which it is held. Not only are the bones of those animals slaughtered in this country employed as manure, but nearly 80,000 tons per annum are imported from foreign countries, chiefly for the same purpose, and yet the supply is by no means equal to the demand. Had not the importation of guano commenced about the year 1840, it is probable that bones would have risen to £10 or £12 per ton.

"That bones must be beneficial as manure," says Mr. Nesbit, in his pamphlet on Agricultural Chemistry, "will appear from a very simple consideration. Animals are fed upon vegetables, and the whole of their bodily structure grows out of the food, or is eliminated and formed from it. If the food did not contain phosphate of lime, the bony structure of the body could not be built up. If the soil in which vegetables grow did not contain phosphate of lime, the seeds of vegetables could not be matured. Supposing the arable land of this country to have been robbed for a thousand years of phosphate of lime, and never to have received any back again; assuming this ingredient to have been continually exported in the shape of milk, cheese, sheep, and oxen, it is clear that unless the land had an unlimited amount of phosphate, which we know is not the case, there must have been a proportionate diminution in the quantity of such materials. Hence it is that when certain substances which had been taken out for a long period have been again suddenly applied, land worth hardly 5s. per acre has sprung up to the value of 15s., and there has been an enormous increase of crops."

One of the most valuable qualities of bones is the slowness with which they decompose, and the length of time during which they continue to give out the phosphates. It is found upon analysis that one pound of bones contains as much phosphoric acid as 28 pounds

of wheat or of 250 pounds of potatoes. Now, a crop of wheat of four quarters per acre, and reckoning it at 60lbs. per bushel, weighs, in round numbers, 2,000lbs., which contains only as much phosphate as is found in 71lbs. of bones. It is clear therefore that if the bones are put on at the rate of 3½ cwt. per acre, supposing them to decompose rapidly and give out the phosphates in proportion, a large proportion would be wasted. But that this is not the case the following circumstances prove. A gentleman, who occupied a large farm in Norfolk, finding, towards the close of his wheat-sowing, that he was likely to have a considerable quantity of bone-dust left, if he continued distributing it at the ordinary rate, directed his foreman to increase the quantity. On going to the field the following day he found that the man had *doubled* the allowance, and that instead of having any to spare, he would not, at that rate, have enough to finish manuring the remaining seeding land. He therefore told him to go back to the usual quantity of about 4 cwt. per acre, at which rate the field was finished. The crop of wheat proved a very heavy one, as well as the succeeding crop of turnips, on that part of the land which was thus doubly dosed with bone-dust. Now mark what follows. *Eleven years after*, the farmer on riding with a friend over his land, came to this field, which was again, for the third time after the above occurrence, under wheat. On entering it, he requested his friend, if he should, in riding down the furrow, find any difference in the growth of the wheat, to point it out. After riding a few yards into the wheat he suddenly stopped. "What in all the world have you been after here?" he exclaimed. "This wheat is six inches higher, and as stout again as the rest; how came this to pass?" The farmer then explained to him the occurrence we have related, and which proves not only the value of bones as a manure for a single crop, but that by the deliberate manner in which they give out the phosphates in decomposition, they possess a more permanent value than any other kind of manure.

But bones are not only valuable on account of the phosphoric acid they contain: they also contain nitrogen in the proportion, according to some chemists, of six, and of others, of four per cent. As the bones decompose this becomes ammonia, the value of which in manure is now well understood by almost all agriculturists. The conversion of bones into superphosphate of lime by the addition of sulphuric acid, by precipitating the decomposition, probably alters the conditions, by caus-

ing the immediate distribution of the phosphoric acid in the sod; and thence it requires a less quantity to be applied to the land to produce a crop. The Americans have adopted a new method of dissolving bones, which may probably be employed to advantage in this country, as the bones will not require to be ground. A ley is made with lime, in the proportion of one bushel of lime to six gallons of water. To two hundred pounds of bones put sixty gallons of this ley, and boil them for a few hours until the bones are dissolved, when they may be reduced to a dry powder, and applied in the same way as guano, or any other artificial manure. This mode of application has been found to produce very satisfactory results. The lime used was made of oyster-shells, as the best for the purpose. "It has been repeatedly demonstrated," says an American writer, "that one

bushel of dissolved bones, *for immediate effect*, is equal to five times as much ground bones; in other words, that one pound of *nascent* or, soluble phosphate of lime, is worth more than five pounds of *normal*, or natural phosphate of lime, or bone-earth." This economic application of bones is becoming more and more common, being cheaper, and involving less labour, and the result is quite as certain and as good. The only difficulty in the purchase of bones, in whatever form, is that of getting them genuine, on account of the adulteration with *scutch*, or the refuse of the tanpits, oyster-shells, and other cheap ingredients, the proportion of which in bones is regulated, with some dealers, by the price paid per ton. We have known as much as 50 per cent. of *scutch* mixed with bones, as agreed on between the merchant and his customer, a country bone crusher.

PLEURO-PNEUMONIA AND HOMŒOPATHY.

SIR,—Observing in your last impression some reference to a case of sand-crack in horses, that was cured by homœopathic remedies, and knowing the impartial manner in which your columns are opened to the discussion of matters relating to the interests of agriculture, I am induced to give publicity, through the medium of your widely circulating journal, to some personal experience with which I have been recently favoured of the successful application of homœopathic medicines to the fatal malady in cattle known as pleuro-pneumonia, or lung disease. In reference to its origin or cause, there is a great diversity of opinion, to which, however, I will only advert by suggesting, as a somewhat probable cause, the crowding together of cattle, *en route* from Ireland or the Continent, in the hot and vitiated atmosphere of the vessel's hold, and then driving them by railway in open lattice trucks through the chilling cold night-air. Were it needful, much could be written to prove the ravages it has occasioned during the last twenty years, carrying off entire dairies of valuable cows, and striking with the fatality of a pestilence amongst the finest herds of the land. So prevalent and destructive has it been in every part of the country, as well as in many districts abroad, that there are but few farmers who have not been the victims of its disastrous visitations, and whose daily experience has been to hear, morning after morning, the same old intimation of the stockman, "*There's another o' them 'ere bullocks queer, sir,*" until it has unfortunately become almost as "familiar in their ears as household words." My purpose, however, is not to refer to the losses which this disease has occasioned, these being too widely known to require any comment from me, but to commend to the attention of farmers and stock-keepers in general the homœopathic method of treating the disorder, which I am convinced by experience may prove a remedy in a majority of cases for this insidious and destructive malady.

Within the last few weeks it has become developed amongst some of my bullocks that were shut up to fatten shortly after Michaelmas. Manifesting itself in the usual variety of forms, it presented symptoms that could not be mistaken by those familiar with its peculiarities. It was generally introduced to notice by the well-known husky cough and sudden loss of appetite, and these symptoms unless promptly checked were followed by quickened respiration, which soon settled into short, oppressed, and difficult breathing, accompanied by the characteristic grunt and grating of the teeth. The pulse was feeble and much quickened, the nose and extremities alternately hot and cold, but generally the roots of the ears and the horns were hot. On applying the ear to the affected side of the lungs, a diseased condition of the organ was indicated, that harmonized with the outward symptoms. When the disorder was detected in its primary stage, it was quickly averted by the homœopathic remedies, without removing the bullock from the yard; but there were three that showed symptoms of the disease in so unmistakably acute a form,

that they were at once placed in the hospital, where a moderate and regular temperature was maintained, and treated successfully with homœopathic remedies. Year after year, with many of my neighbours I had suffered loss from this fatal disorder, and though the beasts affected were formerly attended by a skilful member of the London Veterinary College, I do not remember to have had one thoroughly recover, indeed so hopeless has the method of treatment appeared, that the larger proportion of farmers have ceased to employ the veterinary surgeon in a case of lung disease. As a last resort I was induced to try the remedies recommended by practitioners of the homœopathic school, the result being, as I have stated, the most perfect and gratifying success; and I feel morally certain, from previous experience, that the acute cases I have named would have proved fatal had they been treated under the old veterinary system of physic. The period of treatment for these cases varied from ten days to three weeks, and the medicines given were those prescribed in the works of Rash and Moore. It was very striking, to those who witnessed the whole course of treatment, to observe how quickly the medicines subdued the symptoms for which they were prescribed, and it was no less gratifying and striking to find that although the beasts were kept almost entirely without food until there were manifest signs of improvement, and then but sparingly allowed, they appeared but little worse in condition for their long-continued abstinence, there being a striking absence of the great and rapid wasting that usually accompanies the ordinary treatment of the disease.

Having been thus successful, and regarding these cases as proofs of the practical value of homœopathy in its application to pleuro-pneumonia; I am induced to commend the subject to the attention of your agricultural readers, believing that success, and consequently great benefit, would follow the more general adoption of the treatment. That homœopathy will prove a remedy in at least seven cases out of ten, provided the disease has not run into its latest stage, I have no doubt whatever; but it must be highly essential that the amateur practitioner should possess some knowledge of disease, and considerable judgment in the selection of medicines adapted to the various symptoms that may be shown. Like many others, I had long regarded homœopathy as one of the delusions of the day; but having observed that its foremost patrons were found amongst the clergy and the educated classes in particular, I was led to investigate its merits, if not scientifically, at least honestly, and to test it as a curative agency in the way I have described. And having been successful, not only in one case, but in several, and knowing that many estimable members of the clerical profession have accomplished by homœopathy, in their parochial spheres, such feats of cure as would have reflected honour on more scientific skill, and seeing around me daily proofs of the truth and value of the system in the accumulating tide of evidence that is

rolling in its favour, I have been compelled to surrender the citadel of my scepticism, and to regard it as a rational, humane, and efficacious system of medicine.

The general reluctance of the public to impartially investigate any new theory or principle has long been proverbial; indeed since Solomon, thousands of years ago, wrote, "He that answereth a matter before he heareth it, it is a folly and a shame unto him," it has been the almost uniform practice of the world to allow conclusions and condemnation to *precede* enquiry, and to persecute as impostors those discoverers of new truths, whom subsequent and more enlightened ages have been proud to honour.

Galileo and Columbus, Harvey and Jenner, and other equally familiar and illustrious names now enshrined in the plenitude of their fame, will ever shine as beacon-lights of caution to the precipitate, and should teach us to honestly investigate a question before venturing to pronounce an opinion on its merits.

That English farmers of liberal and enlightened views may be led to take this course, in reference to homœopathy in the treatment of their cattle, is the desire of

Your obedient servant,

AGRICOLA.

Saxmundham, Dec. 26, 1860.

THE HOMŒOPATHIC TREATMENT OF CATTLE.

SIR,—Having witnessed the effects of this treatment of disease, as well on my quadrupeds as my bipeds, for the last six years, I feel it my duty to add my testimony of its value to that of your correspondent "Agricola."

A few years ago my stock was attacked with pleuropneumonia, and the result of a previous visitation having convinced me that it was vain to look to the allopathic veterinary surgeon for help, I resolved to trust to homœopathy. Though successful in a few cases, I was at first disappointed. I had administered a principal remedy for the disease to the healthy stock as a preventive; not proving a preventive, I ceased to administer it so, and for about seven weeks afterwards, fortunately, I had not a case; but the malady again broke out. After this I had five cases, two of which were most virulent, and all of them recovered.

In consequence of this success I have been asked to prescribe for others. To one of my neighbours the remedies were useless; but, as I discovered too late that he had camphor (an antidote to the remedy) about his cattle, I think it not unlikely his failure may be attributed to that fact. In another case the farmer had lost two cows before he came to me; one, which I found too far gone, he lost afterwards. The second I saw was well in two days; and having been told that in my own case I ought to have used arsenicum as a preventive, I advised its immediate use in this. From some cause, this farmer had not another case. Is it not fair to give credit to the arsenicum? A butcher killed a fat beast which I had treated when in milk the previous year for lung disease; he assured me that one lung was entirely gone, and the other fast to the side; but the animal had made a fine fat beast.

I enclose a paper which was published by E. R. for the good of his neighbours. I confess he is more sanguine than myself of the success of homœopathic remedies in pleuro-

pneumonia. I do believe them to be far the most efficacious remedies known; but it is a fearful disease.

In disease generally this treatment will not be appreciated till tried. I believe that a very large proportion of the horses which now die of colic and inflammation would be saved by their owners at once administering a homœopathic remedy. Since I used it I have many a time and oft had colic in my stable; but, with one exception, it has always been of very short duration. The one exception was that of a brood mare I lost last July. She was from home; my groom had forgotten his case of medicines. She had consequently the benefit (?) of the knowledge and most persevering attention of one of the most eminent allopathic veterinary practitioners of the day, but she died. Probably the administration of drastics killed her. Probably the administration, in three doses, of eighteen drops of colocynthis would have saved her. I have frequently, also, witnessed the most happy results of this system upon that most difficult of treatment of all animals—the pig.

Would that men could be persuaded! It is truly painful to think how great a blessing scoffers cast away. Most men will not look at it because their doctors tell them "it's all bosh!" And their doctors believe it to be so, because they cannot understand how such remedies and such infinitesimal doses can have any effect; and yet how few things in nature do they understand! Why will they not *prove* "whether these things be so." Many of the homœopathic practitioners are men who have proved them with a view, as they thought, to their triumphant exposure; but they have become converts, and, notwithstanding its "boshiness," homœopathy has upwards of two hundred educated practitioners in this kingdom.

Yours obediently,

JOHN K. FAENWORTH.

Alderley Edge, Cheshire,
Jan. 1, 1861.

AMERICAN TRADE AND FINANCE.

There is no country in which we are more interested by commerce than with the United States. Hence the condition—political and financial—of that Republic is watched with the closest interest by our merchants and manufacturers. An aggregate trade of fifty millions sterling is carried on between the two countries. For breadstuffs, provisions, cotton, tobacco, and many other important articles we are largely dependent on the States, while they were customers of ours last year for goods of the value of £22,500,000.

After gradually recovering from the crisis of 1857, the healthy and prosperous condition of the country was a subject of congratulation to all, until marred by the financial and commercial panic which has assumed so threatening an aspect within the last few weeks. Our last advices enable us to gather some particulars in connection with the present and the future, which are of much importance.

The President, in his annual message, states that throughout the year the country has been eminently prosperous in all its national interests. The harvest has been abundant, and plenty smiles throughout the land. "Our commerce and manufactures," he adds, "have been prosecuted with energy and industry, and have yielded fair and ample returns. In short, no nation in the tide of time has ever presented a spectacle of greater national prosperity than we have done, until a very recent period." The Secretary of the Treasury, too, in his report writes in the same strain: "The country was never in a more prosperous condition. The exports of the last fiscal year ending June had reached the enormous sum of £80,000,000—nearly ten millions in excess of the previous year, and about as much as Great Britain ships to foreign countries, exclusive of the exports to her own colonies, about half as much more."

The exports of domestic produce from the States, for the present fiscal year, as far as they have been received, indicate an increase fully equal, if not greater, than that of preceding years:—"It is impossible to anticipate the effects which this threatened revulsion will produce upon the business of the country. The absence of all the ordinary causes for such a state of things leaves no data upon which to make calculations—all the elements of prosperity are in existence—abundant crops with remunerative prices, money seeking safe investments—and, indeed, everything to indicate more than the usual increase in trade and business. The causes which have so suddenly arrested this tide of prosperity must be looked for outside of the financial and commercial operations of the country; they are of a political character, and therefore so dependent for their ultimate effect upon future developments, that it is impossible at present to say what will be the extent of their influence. If, as some suppose, they are merely temporary, and will soon pass away, then there will be no necessity for any action of Congress, except to provide for the embarrassments already existing in consequence of them. If, on the other hand, the effect should prove more permanent, the fact will be made manifest during the present session of Congress, and in time for such action as will provide the necessary means to carry on the operations of the Government, and preserve the public credit. Already has the Treasury been seriously affected by these causes; for the receipts from customs have greatly fallen off." The extent and continuance of the present financial crisis through which the country is passing cannot well be determined, but it is to be hoped it will be but of short duration.

South Carolina has absolutely seceded from the Union. The rest of the Southern States are setting up a bold front for separation, and the disunion-feeling seems to gain ground. The secession movement is stated to have originated with, and is impelled by the non-slaveholders, who are the most violent agitators, because, with the present high price of slave-labour in those States, they have but little chance of obtaining negroes and acquiring plantations, unless they can legalize the African slave trade. In the re-opening of this trade they recognize one of the greatest sources of wealth and prosperity. With such advantages and increased cotton supplies, they think they can control the destinies of the world, and make Europe and the Northern States bow in obedience to their will. The continued agitation is doing great harm in raising ill-blood between the North and South, leading to the withdrawal of business orders, the hoarding of specie, suspension of banks, and the departure of free negroes and coloured people from the South.

Taking the entire area of all the slave States, they give a surface surpassing in extent the territories of the five great European Powers, with Spain and Turkey added, and contain a population of about 8,500,000 whites and 4,000,000 blacks. The value of the exports from

the cotton States ports in 1859 was 171,619,000 dollars, and from the border States ports 19,000,000 dollars. The value of the imports was in the cotton States ports 29,000,000 dollars, and in the border States ports 11,000,000 dollars. These States produced in 1850, besides tobacco and cotton, 50,000,000 bushels of wheat and 300,000,000 bushels of Indian corn, besides a fair quantity of sugar, rice, and naval stores. Their physical, agricultural, and commercial status is therefore highly important.

President Buchanan in his message deals boldly with the revolutionary crisis which has set in, and devotes many columns of print to its discussion, in this his farewell address on leaving office. He still thinks that the Union may be saved through an explanatory amendment of the constitution, embracing the following concessions to the South, viz.: 1. An express recognition of the rights of property in slaves; 2. The recognition of this right in all the territories during their territorial condition; and, 3. Universal good faith in the restoration of fugitive slaves. We need not pursue the topic further; but we are pleased to find it broadly stated that since the date of the last Presidential message not a single slave has been imported into the United States in violation of the laws prohibiting the African slave trade. He again recommends the acquisition of Cuba by fair purchase, believing that it would contribute to the wellbeing and prosperity of both countries, "and prove the certain means of immediately abolishing the African slave trade throughout the world."

Passing to a consideration of the financial condition of the Republic, we find that the permanent public debt of the States on the 30th June last was £9,000,000, and that there were treasury notes outstanding to about £4,000,000. The average expenditure of the past three years has been £15,700,000, in the fiscal year ending June next it will be nearly £17,000,000, but by prudent retrenchment the President considers that the sum of £12,500,000 is amply sufficient to administer the Government and to pay the interest on the public debt, unless contingent events should hereafter render extraordinary expenditure necessary. Besides power sought to issue Treasury notes for 11,000,000 dollars, in the place of the balance to that amount of stock of the last authorized loan which cannot be placed. It is stated that the financial necessities of the Government will require a modification of the tariff, and the President recommends the imposition of specific instead of *ad-valorem* duties on all imported articles, to which these can be properly applied, both as a protection to the revenue, and to secure incidental encouragement to the home manufacturing interest. Mr. Buchanan denies that specific duties are necessarily protective duties, and points to the fact that "Great Britain glories in free trade, and yet her whole revenue from imports is at the present moment collected under a system of specific duties." It is proposed to ascertain the average value of certain articles for a series of years at the place of exportation, and to convert the *ad-valorem* now levied into a specific duty.

THE CINCINNATI PROVISION TRADE.

The provision trade of Cincinnati is the most extensive in the United States, and is likely to remain so for some years to come. Illinois, the garden State, as it is called, will ultimately, and probably at no distant period, become the great provision-producing State, and Chicago the great provision shipping port; but Illinois must first receive the addition

of a few millions to its present population before its yield reaches that of the long-settled and fine agricultural State of Ohio, on the borders of which Cincinnati is situated. Cincinnati is so situated that it may draw the produce of Lake Erie and the upper lakes from the Ohio port of Sandusky on Lake Erie, or by any of the numerous Western

railways, and at the same time it may form a convenient halting place for a large proportion of the produce of Kentucky, Indiana, and Ohio, *in transitu* to eastern markets. Ohio supplies its market with cheese and butter, and hogs and cattle; Indiana supplies it chiefly with hogs; and Kentucky, the great grazing State of the American Union, supplies it chiefly with cattle. The trade of so great a centre of supply should be made familiar to those interested in the provision trade of the United Kingdom.

The trade returns of Cincinnati are carefully compiled daily, under the direction of the Board of Trade, not with the view of being advertised abroad, but to guide merchants in their dealings. The latest returns published are for the twelve months ending 1st September of the present year, and the figures compared with similar returns of previous years give all the information that is required. The supply of cheese and butter for the present and previous years has been as follows:—

	BUTTER.		
	Barrels.		Firkins and kegs.
1860.....	15,209	.....	34,468
1857.....	11,352	.....	10,818
1856.....	11,361	.....	12,422
1855.....	10,185	.....	7,132
	CHEESE.		
	Casks.		Boxes.
1860.....	110	.....	227,095
1857.....	238	.....	176,623
1856.....	77	.....	190,983
1855.....	78	.....	183,379

The price of butter has ranged from 6d. to 1s. a pound, and the price of cheese from 4½d. to 6d. a pound, the fluctuation representing the relation subsisting between demand and supply, and having little or no reference to quality. The quality of Cincinnati butter, it may be said, is usually very fine—quite equal to the average of English dairies, the climate of Ohio being good, the cow-feed excellent, the cows well housed and cared for, and, lastly, the farmers' wives and daughters being well practised in butter making. The same observations apply to cheese, and more than usually mild descriptions are to be met with in Cincinnati.

The supply of hogs and cattle for the present and previous years has been as follows:—

HOGS.		
1860.....	522,838	head.
1857.....	407,729	"
1856.....	509,426	"
1855.....	496,360	"
CATTLE.		
1860.....	43,182	head.
1857.....	50,150	"
1856.....	54,400	"
1855.....	40,160	"

The price of pork has ranged from 2½d. to 3½d. a pound, and the price of beef from 3½d. to 4½d.—the fluctuation, as in the case of dairy produce, representing the relations of demand and supply. The hogs brought to Cincinnati are full grown, and generally corn fed, and the quality is therefore very fine. The cattle are also in prime condition, and are packed for exportation. Besides the receipts of live hogs and beef cattle, there are large receipts of dressed meats. The figures are as follows:—

PORK AND BACON.				
	Hhds.	Tierces.	Bbls.	Bulk lbs.
1860.....	4,662	3,882	25,456	23,250,222
1857.....	3,264	1,667	19,713	11,968,483
1856.....	9,734	7,513	26,292	16,482,452
1855.....	5,947	6,770	38,365	18,551,646
LARD.				
	Barrels.			Kegs.
1860.....	47,499	.....		11,319
1857.....	29,465	.....		10,534
1856.....	78,505	.....		14,763
1855.....	53,564	.....		14,338

	BEEF.		
	Barrels.		Tierces.
1860.....	1,393	.....	633
1857.....	681	.....	1
1856.....	1,534	.....	599
1855.....	1,766	.....	4,608

The bulk meat, as it is called, is the only one of these commodities about which it is necessary to say anything respecting price. During the present season, bulk meat—the shoulders of the hogs—has been sold on the average at the low price of 3d. a pound. The highest prices current is 3½d., and a ½d. a pound more would pay the cost of transportation to Liverpool. Large quantities of these shoulders are imported every year, and they are not unfrequently soaked, and afterwards dried and smoked, and sold as hams at 6d. and 7d. a pound.

As a grain market Cincinnati is unimportant, it being generally undesirable to make any break in grain shipments from west to east. Although, therefore, in the centre of an extensive grain-producing district, the receipts are limited to the immediate neighbourhood, of which Cincinnati is properly the market town. The shipments of the present and previous years have been as follows:—

	Flour.	Wheat	Corn.
	Bbls.	Bush.	Bush.
1860.....	478,308	321,495	96,000
1857.....	416,789	384,400	162,200
1856.....	509,031	—	1,500,000
1855.....	199,276	—	128,600

The increase of the present season is therefore small, but it is not improbable that since the 1st September the manufacture of flour in Cincinnati and the neighbourhood has been much increased, in consequence of the large supplies of wheat on hand in the neighbouring states, and the inducements offered by the railways for the carriage of barrel flour.

It remains to notice the destination of the principal commodities exported from Cincinnati. At the present time, New Orleans, and other ports on the Mississippi, receive the bulk of the shipments, owing to the cheap transit offered by the Ohio and the Mississippi rivers; and from New Orleans shipments are made to New York. This is almost exclusively the direction which beef and pork and lard take; while cheese and butter are more frequently conveyed by railway to New York. Wheat and flour are carried higher up the Ohio river to Wheeling and other ports, whence shipment is made to Baltimore and elsewhere by the Baltimore and Ohio Railway.

For the carrying on of this trade, perhaps greater facilities are presented in Cincinnati than elsewhere, as a consequence of the extent of the operations. The usual practice is for arrangements to be made in New York that each shipment may be drawn against at thirty or sixty, or sometimes at ninety days. The proceeds at once re-imburse the shipper for his outlay, and enables him to carry on his operations. In some cases, when such an arrangement has been made, the Cincinnati banking house, through whom the business is to be done, advances the required capital to make the first purchases, and to put the trade in motion. In Cincinnati, as elsewhere in the United States, hogs and cattle and wheat and flour can only be obtained for money down. While such are the inducements offered, it is well known that there is scarcely a more hazardous business than that of packing provisions either for sale in New York or for exportation to the United Kingdom. The production is spread over so wide an area that no sure calculations of supply can be formed.

The aggregate production of hogs in all the States may in one year be a million and a-half; in which case the supply is insufficient for the demand, and high prices are obtained, and the packers prosper; or the production may exceed three million hogs, in which case the supply is largely in excess of the demand, and low prices rule, and the packers are all, or nearly all, ruined. So with cattle. The yield of a season is not known until the season ends, when it is too late to go deeper into transactions which have left a large profit, and too late to retrieve the error of investing money which can never be recovered.

THE AMERICAN GRAIN TRADE.

The position of the American grain trade at the moment is such as to hold out little prospect of a continuance of the large shipments that have been made from New York and the other American ports during the present season, unless orders from the United Kingdom are hereafter accompanied with specie. The exchange in New York is now seriously against England, and the greatest difficulty is experienced in negotiating bills of exchange, whether accompanied with the bills of lading or offered on the responsibility of the drawers of the bills. Specie alone can obviate the difficulty, and, unless it is sent, very little hope can be entertained that orders will be filled.

A brief *résumé* of the existing difficulties will make this clear. In the first place, all the grain worth speaking of has now reached the Atlantic seaboard that can do so, until the latter part of April or the beginning of May. This is owing to the winter—the water communication being stopped, and the railways not being available for carrying grain over the long American distances. In fact, were the railways enabled to carry grain from the west to the east at sufficiently low rates, the quantity that they could carry would be comparatively trifling, it being scarcely possible to run goods trains from Chicago to New York, a distance of ten or twelve hundred miles, in less than thirty days. And the rolling stock of the railways is quite unequal to even the most moderate demand that could be made upon it, to supply waggons, in which grain could be carried, as no provision has been ever made for such traffic.

The question thence arises, What is the stock of grain on hand in New York, the principal American shipping port? That information has been presented in the most authentic form up to the 24th November, since which dates the receipts have been trifling, while the exports have been considerable.

STOCK OF GRAIN IN NEW YORK ON THE 24TH NOVEMBER.

Flour	760,388 barrels.
Wheat	3,553,749 bushels.

This is the available stock on hand in New York for the consumption of that city until next May, and for exportation till that time. The estimate of the weekly consumption of New York being from 55,000 to 65,000 barrels of flour, and fifteen weeks intervening between the 24th November and the 1st May, the flour consumption in New York will exceed 1,000,000 barrels, which will not only absorb the whole remaining stock of flour, but make a serious inroad into the stock of wheat. And it is to be observed, that the balance will not be altogether at our disposal. Shipments to some extent are being made from New York to the continent; and the Lower British Provinces of Newfoundland, Nova Scotia, and New Brunswick, and the West India Islands draw the bulk of their supplies from the same market. The further grain shipments from New York to this country will therefore be very limited.

This conclusion might be fortified by the experience of previous seasons. The following is the falling off in the shipments from New York from December to May in the different years.

	FLOUR.			
	1859-60.	1858-59.	1857-58.	1856-57.
	Brls.	Brls.	Brls.	Brls.
December ..	139,589	58,266	104,584	205,808
January	49,138	30,930	125,720	110,546
February	34,635	36,120	108,982	94,305
March	69,193	49,140	73,553	119,655
April	83,445	71,168	124,790	80,123

	WHEAT.			
	1859-60.	1858-59.	1857-58.	1856-57.
	Bushs.	Bushs.	Bushs.	Bushs.
December ..	117,112	9,787	468,325	1,464,201
January	50,196	10,759	180,631	239,994
February ..	59,299	5,990	17,358	177,179
March	23,842	600	33,257	270,061
April	175,878	1,567	127,743	133,708

	CORN.			
	1859-60.	1858-59.	1856-58.	1856-57.
	Bushs.	Bushs.	Bushs.	Bushs.
December ..	9,086	15,560	49,190	237,540
January	4,149	5,789	144,684	142,642
February ..	23,561	20,775	256,797	311,701
March	70,321	19,298	412,406	681,560
April	105,786	21,701	456,814	357,528

The decrease in the shipments of flour and wheat is very marked. In corn there is an increase; but that, it need scarcely be said, is the kind of grain upon which the least importance is placed in England.

Another difficulty, in the way of grain being hereafter shipped from America in large quantities, is peculiar to the present season, arising from the great abundance of the last American harvest. It was supposed that, in consequence of the large stock of grain still remaining in the hands of the Western farmers, large quantities of wheat would be sent to the flour mills, and the flour despatched by railway to New York. Considerable importance was attached to this probability a few weeks ago, but the decline in price in New York now renders it far more profitable for the Western farmers to keep back their wheat until the navigation again opens. In fact, in view of the low price now realized for flour and wheat in New York, it is inconceivable, on any other supposition than the necessities of those sending, that any further supplies will be sent at all. Just now the barrel flour, which sells freely in Mark-lane at 28s. and 30s. a barrel, may be purchased as freely in New York at 18s. and 20s.; while the freight from New York to Liverpool is from 8s. to 8s. 6d. a barrel. This depreciation in New York is wholly owing to the existing complications consequent on the disunion prospects; and to sell at all is therefore to make an apparent sacrifice.

The third, and last, difficulty that may be named, is the failure of several of the leading New York receivers. This leads, as a matter of course, to more or less disorganization in the trade, and to a prevailing want of confidence. Of itself, this failure of the New York receivers—to whom Western grain is consigned—would have been sufficient to check Western consignments during the winter; but, superadded to the other difficulties, there is but the one conclusion—that this season, as in all preceding seasons, the heavy grain shipments from America have now closed.

It is, however, possible for British capitalists and those interested in the grain trade to take advantage of the present depression that exists in all the markets of the United States, and step in as buyers. They may send out specie to New York and clear the samples from the tables of the Corn Exchange; or they may make purchases in the interior of Illinois, where purchases on still more advantageous terms can be made, and the railways of Illinois may be used, not for the long distance to New York, but for the short distance to the open water of the Mississippi, whence cheap water transit can be secured to New Orleans. But for the political troubles in the Southern States, the New York dealers would have themselves resorted to this experiment of bringing supplies of wheat and flour forward to any extent that might be required; but the New Yorkers, in consequence of the abolition stigma, cannot venture South. Englishmen can have no such apprehension; and it will now depend upon the action taken by ourselves whether the balance of the crop of the Western States is at once brought forward, or let alone until the spring.

ANNUAL REPORT OF THE LINSEED AND OILCAKE TRADE.

Sir,—The recurrence of a new year affords us the pleasure to furnish you with our annual retrospect of prices and statistical accounts of imports, &c.; and in doing so we must again call your attention to the increased consumption of seed: notwithstanding a continuous large supply, the demand throughout the year has been in advance of it, and had the trade but been a little more remunerative to the crusher, so extensive is the mill power now in existence, we should have had even a larger consumption than the following figures show. Early in the year the prospects of business were encouraging, but the subsequent rise in prices not being accompanied in the same ratio by a corresponding advance in cake and oil, the trade has of late been of a very restricted character. The prospects for the remainder of the season, namely, ample supplies of seed, and probable large demand for cakes, lead us to hope we shall yet have to record a remunerative year for the manufacturers as well as importers.

LINSEED.—At the beginning of last year, Black Sea seed was 49s., and for the first six or seven weeks it scarcely varied sixpence per quarter. Crushers being pretty full of seed were not driven into the market to purchase; but, on the other hand, the cake trade was so good that stocks were well kept up in anticipation of the supply proving inadequate as the season progressed. Towards the beginning of March a rise took place to 50s., which was increased to 51s. as the month advanced, and was attributable partly to the north-east wind retarding supplies, and also to a Continental demand; this demand continued during the spring months, and assisted in keeping prices unusually steady, until the altered state of corn markets later on altogether changed the aspect of the market. In April large arrivals reduced the value to 49s. (with an occasional sale at even less), but exceptional purchases for America at this time, together with a heavy speculative demand, on French account, for oil, for future deliveries, enhanced the value to 50s. 6d. During May, however, renewed heavy importations, and a change to brilliant weather, reduced the value to the lowest point of the year, namely, 48s. Some three or four months previously, purchases of Black Sea for summer shipment had been made at 48s., which were continued at intervals on the same terms, to 1s. more; the Greek houses being anxious sellers, but crushers, as the rule, unwilling buyers, and the business done, therefore, was chiefly for exporters' and speculators' account (the latter including several merchants usually importers from Russia). With June we had bad weather, and indications of the coming change in the corn market, and spot seed advanced to 50s., future deliveries selling at 51s. July was a flat month, and 49s. again quoted; but during August those crushers who had until then withheld altogether from buying, became desirous partially to supply themselves, and an almost immediate rise occurred, 53s. being quoted for ready seed, and 54s. paid for seed then shipping. During September a further advance was established, and 55s. current value at the end of the month; and in the then state of the weather also, and prospects of harvest, consumers who had neglected to provide their season's requirements getting very anxious, and taking such cargoes as offered at daily enhanced rates. In October 56s. was given, and an additional 1s. for late shipments, and the increased value of, and large demand for cakes improved the price to 58s. during November: speculators still giving an extra 1s. for distant deliveries. During all last month we were very flat at 57s., but stocks are evidently running short again, for to-day an advance of 1s. per quarter over that price would be readily obtainable.

Our foregoing quotations, as you will have observed, are for Black Sea seed, which quality probably serves best to mark the various fluctuations in price: it is not, however, so good a test of the market as it was, for it continues to come so much mixed, crushers cannot now use it by itself, and it has occasionally, in consequence, borne a relatively low value to other descriptions. Morshansky having sold at 1s. to 1s. 6d.; Calcutta, 2s. to 3s.; and Bombay at 4s. to 5s. per quarter higher; whereas, a few years since, the

former would not fetch within 1s. or 2s. of Odessa or Azov seed, and Calcutta (which was then clean also), and Bombay, generally sold at equal rates: the shorter yield of oil in the Black Sea, compared to East India, being compensated by the extra weight in the seed of the former description.

Exporters have taken an unusual proportion of cargoes calling for orders, as will be observed by reference to the particulars: the tone of our markets has in consequence been greatly influenced by those of the Continent—in fact, more so the past year (and particularly during the summer) than in any previous one: late in the autumn, however, we were relatively higher than abroad, and several floating cargoes, originally purchased for foreign account, have been resold and ordered here to discharge.

It must be borne in mind, that although our import in the aggregate is about the same as 1859, the last three months show a considerable deficiency, and stocks are lighter than usual at this season, both in granary and in crusher's hands; but, to set against this, we have a larger quantity afloat, affording the prospect of full supplies for the remainder of this season.

The usual contradictory reports are given as to the last harvest in Russia, that it is quite impossible to form any just estimate of what the supplies may turn out to be: it seems certain that it is not practicable, over such a vast district, to get reliable accounts; but, as in the present day, with the greater facilities of communication, the tendency of production must be to increase, we see no reason (although the annual cry of short crops is again raised), why we should not have equal, or, perhaps, greater supplies than in previous years. We are glad to say all accounts agree in reporting a superior growth, as to quality, both from the north and south of Russia. A few cargoes of Azov seed for early spring shipment changed hands a short time ago at 55s. to 54s., but the transactions were very limited—the free on board price for that period, not leaving enough margin for sellers, and the prospects of the trade on this side equally deterring buyers from entering into contracts for such distant deliveries.

The East Indies also (particularly the Bombay district), promises a large quantity, and of the ordinary fine description.

We have nothing new to remark in respect of the seed imported, the characters of the different descriptions are quite unchanged, and we should simply have to repeat what we have written in every circular for the last three or four years.

Our stocks in public warehouses here are nil, that is to say, do not exceed 5,000 quarters altogether. At Liverpool they are also nil. At Hull they are 95,000 quarters, viz., about 55,000 quarters in granary, and 40,000 quarters in the mills, or on board ship in the docks. Afloat, we have a total of 430,000 quarters; namely, 200,000 quarters Black Sea, &c.; 145,000 quarters Calcutta; 55,000 quarters Bombay; 30,000 quarters Alexandria, Lower Baltic and sundries. The East Indies also, notwithstanding the high cost, is likely to furnish us with further large quantities during the spring, so that we shall have an import for the season greatly in excess of any previous one.

Subjoined are the respective annual official returns of the aggregate imports into the United Kingdom:

	Qrs.		Qrs.
1841	363,401	1851	630,471
1842	367,700	1852	799,402
1843	470,539	1853	1,035,335
1844	616,947	1854	828,513
1845	656,793	1855	756,950
1846	506,141	1856	1,180,179
1847	439,512	1857	1,051,113
1848	799,650	1858	1,017,844
1849	626,495	1859	1,270,911
1850	608,984	1860	about the same.

The port of London shows a decrease of about 50,000 qrs;

Hull an equal increase; Liverpool has been out of all proportion to former years, causing that port for a long time to be relatively the cheapest market, and numerous traushipments were made thence, which included cargoes as well for the East coast of United Kingdom, as also for Belgian and Dutch ports, and for America.

The imports of the working season, namely, July to June, of each following year, have been as annexed:—

1848-9, 50-51, 51-52	700,000 qrs.	1855-56	.. 644,000 qrs.
1849-50.....	600,000 "	1856-57	.. 1,108,000 "
1852-53.....	825,000 "	1858-59	.. 1,214,063 "
'53-4, 4-5, 7-8	1,000,000 "	1859-60	.. 1,318,536 "

And 1860-61 will show a further increase, probably bringing up the total to more than 1,400,000 qrs.

The 350,000 qrs. imported into London consisted of 315,000 qrs. from East Indies, 21,000 qrs. from Black Sea, 3,000 qrs. from Archangel, and the remaining 11,000 qrs., from Alexandria, Baltic, and sundry other ports.

The re-export from England amounted to 125,000 qrs. against 100,000 qrs. in 1859, 130,000 qrs. in 1858, and 30,000 qrs. in 1857.

The aggregate into the United Kingdom is made up of about 250,000 qrs. from Bombay, 300,000 qrs. from Calcutta, 165,000 qrs. from Petersburg, 32,000 qrs. from Archangel, 115,000 qrs. from Riga (including about 20,000 qrs. sowing seed), 60,000 qrs. Lower Baltic, Alexandrian, and other Mediterranean ports, and sundries. The Black Sea cargoes calling at Falmouth for orders consisted of about 460,000 qrs., which were discharged as follows:—Hull 165,500 qrs., Grimsby 34,600, London 21,450, Ipswich 15,500, Liverpool 13,600, Southampton 13,000, Boston 10,600, Gloucester 10,500, Newcastle 10,100, Leith 8,950, Lowestoft 8,100, Yarmouth 7,300, Rochester 6,100, Lynn 5,550, Dover 3,450, Dublin 2,750, Cardiff 2,600.; 180,000 qrs. went to Belgium, 10,000 to Holland, and 6,000 to France.

The direct export from the North of Russia to Continental ports has again largely increased, consisting of 30,000 qrs. from Petersburg, 25,000 from Archangel, 60,000 from Riga, and about a similar quantity from Memel, Königsburg, &c.; also some 50,000 qrs. of Sowing Seed from Riga; the total showing an excess of about 25,000 qrs. when compared with 1859.

LINSEED OIL.—There has again been an active trade done in this article, and, considering the enormous number of speculative transactions, prices exhibit an unusual degree of steadiness; this is probably attributable to the willingness of crushers to enter into forward contracts; because, knowing the proverbial uncertainty attaching to linseed oil, they are always eager to secure a marginal price to remunerate them for working expenses, looking more to cakes than to oil for profit. When our last annual circular was issued, £27 10s. was the quotation; and for the first four months of the year it scarcely varied 5s. per ton, the supply being very large, and the low price inducing an equally large demand. By the end of April the incessant inquiry for future deliveries, at about £29 per ton, had drawn up the spot price to £28, and between then and the middle of June a further 5s. per ton rise was established, and another 5s. by the end of the month, £28 10s. being then the exact quotation. July showed oil to be scarce, which need not be wondered at, with the short make then going on, and the enormous export which had taken place up to that period. In August the continued short make of oil, and the reported bad result of the continental rape harvest, caused considerable inquiry (chiefly on French account), both for ready oil and likewise for future deliveries, and the value rose rapidly to £31. This rise was partly lost in September, owing to re-sales to secure profits, and our markets became decidedly flat at £30. In October an abortive attempt was made to re-establish August prices, and £31 was paying for a few days, but by the end of the month the demand was so slack, £30 was again with difficulty got. A further decline of 20s. per ton followed in November, since when we have had a large and steady business doing at unaltered rates, namely, £29. The future course of prices depends entirely on the export demand, and to ensure a continuance of it upon a sufficiently large scale to prevent accumulation of stocks, it seems a low price is indispensable; we are not likely therefore, we think, materially to vary the current rates during the ensuing spring months.

The export has again increased by 5,000 tons, being about 35,000 tons, against 30,000 tons in 1859, 26,000 tons in 1858, 16,250 in 1857, 28,000 tons in 1856, and 17,500 tons in 1855.

To-day we are flat, at a decline of 5s. to 10s. per ton upon last month's quotations.

LINSEEDCAKES.—The destruction of turnips by the frost last winter, together with the scarcity of all feeding stuffs, and the subsequent ungenial summer weather, caused a progressive improvement in the value of this article, the rise at present being fully £2 per ton over our quotations of last January. The first two causes being still in existence, and indeed to a greater degree, we doubt not prices will be maintained, and as the season advances, and stocks necessarily become diminished, there may probably be further improvement. Town-made in January were flat at £9 5s. per ton, but towards the close of the month improved 5s. to 10s. per ton, and during February, March, and April were in great request at £10 to £10 10s. In May we had a slack demand, and as dealers would only buy to meet pressing wants, the value receded to £9 10s., which also was the price in June and July, accompanied by very slow sale. In August prices rallied to £10 to £10 10s. again, and the trade continued active thereat all through September and October, whilst in November a further rise of 20s. was established, and value stood at £11 to £12 per ton. During last month the inquiry was slack, without, however, altering the rates: but for the last few days renewed demand gives every indication of still higher prices for the remainder of the season.

Of foreign, the import is again very large, and will be found to have exceeded 100,000 tons. The year opened with a dull trade at £9 5s. for New York bags, and £9 12s. 6d. barrels; but towards the end of January, stocks running short, prices advanced £5 per ton, and during February the consumption was so great, a further rise was established of 15s. per ton, £10 5s. being paid for bags, and £10 12s. 6d. for barrels. In March and April supplies being very liberal, the value remained stationary, with symptoms of a decline towards end of latter month. In May, in face of continued heavy arrivals, dealers bought as sparingly as possible, and prices dropped 10s. to 15s. per ton. Early in June a further fall of 5s. per ton took place, and this induced buyers to operate pretty freely again, the value improving by end of the month to £9 10s. for bags, and £9 15s. barrels. July and August brought a good demand, which increased towards end of the latter month, and importers were enabled to obtain a further advance of 15s. per ton; this improvement continued and increased throughout September and October, bringing up the value of bags to £11, and barrels £11 10s. At this time, also, a very large business was done in Marseilles Cakes for shipment at £9 5s. to 10s. c. f. and i., and £10 free delivered. In November we had a brisk business doing, and 10s. per ton more money paid, but during the past month there has been the customary slackness in the trade, and prices have given way 5s. to 7s. 6d. per ton; this fall, however, seems in a fair way of recovery, for to-day we have had numerous inquiries at £11 5s. to £11 10s. for American bags, and £11 15s. barrels; also at £10 10s. for Marseilles.

RAPSEED AND OTHER OIL SEEDS.—The import of these articles has greatly diminished as compared to 1859: the re-export, however, showing a proportionate decrease, the actual consumption in this country has probably not varied to any considerable extent. 45s. per qr. was the price of average Calcutta in January last, and owing to very light imports at first, and afterwards to the bad prospects of the Continental Rapeseed crop, and subsequently the bad condition in which it was harvested, the article gradually improved in value to 60s., at which rate, with but trifling fluctuations, it has been steady for some months past. The quantities in warehouse, and afloat, are very small, probably not exceeding 40,000 qrs., or less than one-third of last year's stock. Fine Bombay Guzerat is worth 68s.; Poppy Seed 60s., Niger 50s., Teel, Sessame, Sursee, and Gingelly 60s. to 65s., according to quality; the prices of each (excepting Poppy) being all but nominal.

RAPSEED OIL has been largely dealt in since our last, numerous speculative transactions being induced by the uncertainty regarding the Seed harvest, and the known short

importation of East India sorts. From 40s., which was last January's value for refined, the price went steadily up to 44s. and 45s. in the Summer, improving to 48s. at the end of August, since when it has steadily receded to about 44s., which is to-day's quotation. The stock of foreign at the wharves is greatly in excess of any previous period.

RAPECAKES have again found great favour for feeding purposes, and especially since the rise which has occurred in linseedcakes. During the spring of the year the large make kept the price down, but since the summer it has improved

nearly 50 per cent. £6 5s. being to-day's value, against about £4 5s. at the corresponding period of last year.

TALLOW improved from 57s. 6d. to 60s., during the first few weeks of last year, it then gradually dropped to 51s. during the summer, was afterwards forced to 62s. in October and November, and has since been very flat, at a decline of 2s. per cwt. The market is still governed by the Russian speculators, and far removed from the ordinary influences regulating articles of commerce.

London, Jan. 1.

EDWARDS, EASTY & Co.

TRADE OF THE PORT OF HULL.

REPORT FOR THE YEAR 1860.

Like the year 1859, that just closed has been one of progressive improvement and extended production, combined with steady and enlarged business in commerce and shipping throughout the country. The agricultural interest has been the sole sufferer through the influence of a most adverse season for the ripening and ingathering of the grain and fruits of the earth. With regard to the trade of this port, it may be said to have fairly overtaken the provision made for its execution. The docks are crowded with shipping—the space being quite inadequate to the demand and requirements of business, in addition to which the means provided for the land transport of goods and produce into the interior have been greatly deficient, a state of things demanding vigorous and speedy amendment. The commercial treaty with France is likely to prove very beneficial to this port, being so favourably situated for the export to that country of our manufactures, coals, &c. The tonnage entering the port during the past year was 1,212,521 tons, against 1,138,189 tons in '59, being an increase of 74,332 tons on that year, and 125,561 on 1858. The steam tonnage also exhibits an increase of 3,778 tons, being 40,963 tons in 1859 and 44,741 in '60. The tonnage of vessels reported inwards on foreign voyages in 1859 was 784,026 tons, whilst last year 852,838 was entered, being 68,812 tons in favour of 1860.

WHEAT.—The import this year is 528,790 qrs., showing an increase of about 61,035 qrs. as respects last year, and 153,505 qrs. in 1858.

In taking a retrospective view of the wheat trade during the past year, and taking into account the peculiarity of the season throughout, and the dire effects caused by the continuance of untoward weather, resulting in a very moderate ingathering of the crops in general, but more particularly the staple article wheat, it is worthy of remark that the trade has been almost void of speculation, supply and demand having ruled entirely this important branch of trade. Had such a season occurred some twenty years ago, the value of breadstuffs would no doubt have been greatly enhanced, and the year just closed upon us might not have left the principal consumer—the working classes—in such a prosperous condition, and the staff of life at little over the average price of consecutive seasons. Speculation has luckily kept dormant; the recollection of similar seasons in years gone by form, now, no landmark to guide operators in the present. "Tempora mutantur, et nos mutamur ab illis;" we are at trade with the world; distance is annihilated by the electric wire; and any occurrence that may tend to raise or depress values is known at once in most of the chief corn-producing districts on the continent of Europe, and, ere many more years have elapsed, is likely to be the case with America; so that the foreign grain trade stands now on the footing "to buy in the cheapest and sell in the dearest market." Moderate but legitimate profits seem to be the result arrived at; and the enormous fluctuations that, in years gone by, caused the trade, generally, to be looked upon with distrust, are not, under the present cautious system, likely to recur. A gradual rise has been the chief characteristic of the trade during the past year; home-grown and Baltic wheats, in which the business of this port chiefly consists, will serve best as quotation and reference in reviewing the past, and we find that twelve months ago the value of Eng-

lish red was 44s. to 46s. per 504 lbs., red Baltic 45s. to 46s., and Dantzic white 50s. to 52s. per 480 lbs., with but a very moderate demand for foreign of any description, the supply of home-grown apparently sufficing for consumptive wants; and as an instance of the liberal supplies from our own farmers, we find that the quantities sold and entered in the "Gazette" return exceeded in two months 196,944 qrs. over a corresponding period in 1859. January, February, and March prices varied but little, and the price 45s. per 504 lbs. for the best runs of red appeared stereotyped, and imports up to the middle of March had not reached 5,000 qrs. foreign wheat; but towards the end of that month reaction set in, Belgium and Portugal appeared as buyers in the Baltic, and caused some animation in this country, and prices advanced 5s. per qr. before the close of the month. About the middle of April demand for Ireland set in, and buyers appeared also from the agricultural districts; the surplus of 1859 appeared to be getting exhausted, and before the end of the month prices had advanced 5s. per quarter further, making the whole advance nearly 10s. per qr., say English red 54s. to 55s. per 504 lbs., red Baltic 53s. to 54s., Dantzic white 56s. to 57s. per 480 lbs., and imports up to this period did not exceed 10,000 qrs. Up to the end of May and during June, the weather continued very unsettled, a complete hurricane, accompanied by snow, fell in various parts, and future prospects were anything but promising; added to this the French appeared as buyers both in the Baltic and German ports, and before the end of June prices had run up to 60s. for English, and others in equal ratio. About the 21st June a stray wheat ear might be found in forward soils, and the first week in July the plant was generally shot in this neighbourhood; towards the close of this month incessant rains set in, and the crops were much laid in consequence; still large arrivals from abroad kept the trade in check, and as an instance of the enormous importation into London in one week, we find an arrival of cereals amounting to 330,000 qrs., without having any material effect on prices. At the commencement of August, the potato disease again appeared; but simultaneously with this, came the encouraging accounts from America that the crops in the Southern States had been fully secured, and in the Western about half gathered, in the best possible condition, and of fine quality; still prices gradually crept up, during August, to 64s. to 65s. for best English red.

Harvest was general in this district first week in September, and prices rather receded; but towards the middle of this month the new crop was tested by thrashing, and gloomy accounts both as regards quality and yield was the result, and weight very unsatisfactory to the grower; prices recovered towards the end of the month, at which period, owing to the continued wet, fully one-half the crop remained unsecured, and we commenced October with old Dantzic 70s., old English red 68s. to 70s. Delivery of the new crop came out more freely at this period; this combined with large arrivals from America, the South of France, and part Baltic imports, caused prices to recede, more especially for new English, which was found so defective in the yield of flour that many of the first-class millers would scarcely make a bid for any but picked parcels. The month of November is proverbially dull, and the past has proved no exception, more especially as regards new

wheat; but early in December, in spite of enormous arrivals, the price began to advance and continue gradually to improve until the present period, and we commence the year with prices as follow: Finest Dantzic 70s., finest red Baltic 65s. per 480lbs.; the stocks in granary, in spite of the increased imports compared with last year, are much the same, and these consist chiefly of Russian and second-class descriptions.

The value of English wheat of the new crop varies so much that quotations would only mislead, there being a variation of 30s. per qr. between the lowest and the highest point, owing to the disparity both of quality and condition, and although fine wheats have ruled comparatively high, still the agricultural interests having generally only an inferior article have not participated, and owing to the defective yield and low weight and bad condition combined, the last ingathering has been very unfavourable for the British farmer. It is no part of our duty to predict as to the future, but as the enormous imports since harvest have been actually needed, and mostly gone at once into consumption, it would be only reasonable to suppose that, now that these supplies are likely to be materially curtailed by the closing of the ports abroad, future prospects for the agriculturist are decidedly brighter, more especially as the manufacturing districts are well employed, consumption great, and the condition of grain much improved by the late severe frost.

BARLEY.—Large as was the import of this grain in 1859, it has nearly been doubled in that just passed, being 433,050 quarters, the largest ever known, against 245,728 quarters the year previous. The scantiness of the home crop of that year, indifferent pastures in the present season through excess of wet, and the unusually late and, as regards quality, unsatisfactory harvest, caused supplies to be brought forward from every barley-growing country, and hardly ever have stocks been so nearly worked up as was the case before the last harvest. Abroad the yield has been various—Denmark, Sweden, the Rhine, Saale, and Oderbruch districts having produced the best qualities for malting purposes. Prices ranged high throughout the year, and the decline of 2s. to 3s. per qr. in June, about the closing of the malting season, was soon recovered, since which they have gradually advanced, and stand now 4s. to 5s. per qr. above the rates current of this time last year, present quotations being of English malting 36s. to 46s., Danish 39s. to 44s. per qr. 56 lbs. Saale 42s. to 44s. per qr. imperial. Oderbruch 43s. to 44s. per qr. 52½ lbs. Grinding 31s. to 35s. per qr. 52½ lbs. for thin and stout respectively. Our present stocks are computed at 25,000 qrs., of which a large proportion is French, against 8,500 qrs. at the end of '59. Of rye the import this year amounted to about 12,500 qrs., and maize about 12,860 qrs. Dari or Millet seed nil.

OATS.—From the same causes, we have also to report a considerable increase in the import of this cereal, the same being 152,678 qrs., or about five times larger than last year, and never approximated in the last decade. From scarcity prices advanced 4s. to 5s. per qr. from the beginning of the year until October, when they ruled 28s. to 29s. per qr., 42 lbs.; since then a decline of about 3s. has taken place, and we now quote good new corn at 25s. to 26s. per qr., 42 lbs. Our stocks are 15,000 qrs., mostly Danes and Swedes, against 3,700 qrs. end of last year.

BEANS.—This article has, without a single check, advanced in value throughout the year, the only marked decline being caused by the soft produce of this year's crop, which also, as regards quality, has been an unsatisfactory one; indeed, in many places they have only been led since frost and snow have set in: The import is 62,200 qrs., being about 5,000 qrs. more than last year. Stocks on hand are only 6,000 qrs. against 8,500 qrs. end of last year. On the 1st of January last, prices of good dry middles stood at 40s. to 41s. per qr. 63 lbs., whilst at the present moment sound kiln-dried new and good old are at 48s. to 50s., and soft new 41s. to 42s.

PEAS.—Of this pulse the import has been larger than has been the case for the past ten years, say 59,428 qrs., against 17,086 qrs. in 1859; but prices have been subject to little oscillation: like beans, they have almost uninterruptedly advanced, and are now about 6s. per qr. higher than at this time last year: present value 42s. to 43s. per qr. 63 lbs. for

good feeding, and about 2s. more for boilers. Our stocks are larger than last year, say 10,000 qrs. against 3,600 qrs.

AGRICULTURAL SEEDS.—Prices of red cloverseed opened at the commencement of the past season, 1860, at moderate rates, and remained tolerably steady until about the middle of the season, when the superabundant crops in Germany, the North of France, and America, added to a good year in this country, becoming definitely ascertained, prices gradually declined 8s. to 10s. per cwt. from their highest point, and the season closed at the lowest values that have ruled for many years past, taking into consideration the excellent qualities of the German and American seeds especially. Really fine seeds were to be bought at 40s. to 44s. per cwt., and many purchases were made for holding over, which investments have now turned profitable speculations, many parties having realized advances of 6s. to 8s. per cwt. The continued wet weather of the past summer spoiled the prospects of an abundant yield of red seed in most countries, (the crop in this country being an *entire* failure), and as far as can be yet ascertained, only Germany, the South of France, and America will be able to furnish us with seed of fair and good qualities, and these countries only to a moderate extent, and that present prospects are favourable to some advance upon current rates, which may be quoted as follows: 50s. to 54s. per cwt. for good useful yearling seeds, and 60s. to 64s. for fine new seeds. The almost entire clearance of stocks in the season of 1859, and the reported small yield in the autumn of that year, caused white cloverseed to open at high rates at the commencement of the season 1860; good to fine seed fetching 80s. to 90s. per cwt., and about these values were maintained with tolerable steadiness until nearly the close of the season, when somewhat lower prices were accepted. The ungenial weather in the spring prevented the usual activity of demand, which would have brought higher prices, and also curtailed the consumption to such an extent that the anticipated clearance of stocks was not effected, and some few parcels remained unsold at the close, though no quantity of moment. The last autumn's crops in the various countries, owing to the wet summer, are much below an average, the greater portion being of poor quality and much discoloured. Present prices are below last season, say 75s. to 80s. per cwt. for fair good seed, up to 90s. for fine, and 95s. for extra. Fine seeds will be scarce in the season, and such will probably command very high rates. Trefoil was tolerably well cleared out at the close of last season, and as the English crop, our main supply, is this year almost a total failure, and foreign seed much injured, high rates may be expected, especially for fine qualities, which will be scarce. Present values are 22s. to 26s. for middling and fair seed, up to 30s. per cwt. for fine. Tares 11,000 in stock, value 40s. to 42s. per qr.

LINSEED.—The direct import of 1860 is in excess of any previous year, being 528,790 Qrs.
Estimating that the year commenced with a stock of 90,000
And that we received coastwise from
London and Liverpool 51,700

It would appear that our total supplies amount to 670,490
Which, after deducting present stocks in all hands 80,000

Shows the actual consumption to have been 590,490
Against 538,060 qrs. in 1859.

The imports into Grimsby for 1859 was 49,312 qrs., in 1860 41,273; and Gainsborough 16,490 qrs., against only 8,269 qrs. during 1860.

On 1st January, the price of Black Sea linseed on the spot stood at 49s. per qr., and notwithstanding large arrivals this month, an advance of 1s. per qr. was established. During the next three months prices ranged from 50s. to 51s. per qr.; the cake trade being good, the demand was well sustained throughout this period. The last week in April 51s. 6d. was made, but within a fortnight the cake trade had fallen off materially, and its value receded to 49s. 6d. to 50s. In the month of June it declined to 49s. per qr., its lowest price on the spot during the year.

Until the middle of August the market remained steady at 49s. to 50s., then rapidly advanced to 53s.; a large speculative demand for oil appearing, and cake being dearer, about the middle of October a further improvement took place. On the 1st of November the market value was 56s. to 56s. 6d. per qr., with a still rising tendency, until 58s. was demanded, when a very unsettled state of monetary affairs ensued, and the bank rate was raised to 6 per cent.; a reaction was brought about, and the market declined 1s. to 2s. per qr., oil and cake giving way in price. Considerable dullness prevailed during the month of December, and many of the mills wholly or partially closed; with severe weather there is again a somewhat better enquiry, and now there are no sellers under 57s. 6d. to 58s. per qr. Considerable purchases, partly speculative, for spring shipment in the Azoff and Black Sea, were made in February at 48s. per qr., and were followed up by further business at gradually advancing rates during the year, until November, when as much as 58s. 6d. to 59s. was paid for shipment to the close of the navigation. Our crushers mostly held aloof until the season was well advanced, and serious consequences were generally apprehended from the excessive wetness of the season, both with respect to the hay crop and the harvest, a most important element as affecting the success of the business done in anticipation. The quality of linseed from the Black Sea and Azoff has been of the usual inferior character, but the sales were made, chiefly by sample, thus establishing a standard of quality. A few cargoes have changed hands on speculation, for next spring shipment, at 54s. per qr. delivered, a high price to commence with, and which our crushers refuse to entertain. The import from Petersburg has been large, 50 per cent. above that of last year, the greater portion of which proved of middling and inferior quality, a small part only being really fine. Riga about the same as last year. Of Bombay there is an increased direct import of 44,267 qrs., against 20,750 qrs. last year; this description of seed gains favour in our market, being more reliable than other sorts, though there is a marked difference in the shipments. Archangel seed has proved rather better than last season, though of light weight, and by no means fine; samples are shown for spring shipment, very superior to the import of late years. The present value of Black Sea is 57s. 6d. to 58s. per qr.; Bombay 62s. per qr.; Petersburg 45s. to 58s. per qr.; Memel 46s. to 54s. per qr.; Königsberg 46s. to 54s. per qr. Stocks are estimated at about 80,000 qrs., against 90,000 same time last year.

LINSEED OIL shows a greatly increased export, amounting to 19,352 tons, against 14,754 tons in 1859. The year opened at 27s. 3d. to 27s. 6d. per cwt., and this price continued with slight fluctuations until the end of March, when it stood at 28s. per cwt., varying but 3d. more or less until the end of July, at which time 28s. 6d. was paid; and during August it further improved to 30s. 6d. to 39s. 9d. per cwt. Throughout September and October it ruled from 30s. to 30s. 6d., receding to 29s. 6d. at the end of November; and at the close of the year to 28s. 10½d. to 29s.

LINSEED CAKES.—The partial failure of the turnip crop was severely felt in the early months of the year. The first week in January the value was £9 2s. 6d. to £9 5s., and by the end of the month £10 5s. to £10 10s. per ton, and touched £10 15s. before the middle of March: a decline then followed, £9 10s. to £10 being the value in April and during the first fourteen days of May; after that time the demand fell off rapidly, and in June and July £9 to £9 5s. was their value. The latter end of August brought about a better demand, and improved prices; £9 15s. to £10 was realized for the next few weeks. Early in November sales were made at £10 10s. to £11, and before the month was out £11 5s. to £11 10s. was demanded, and in some instances paid. These high rates stopped business, and brought orders to resell, in many instances, both from dealers and speculators. The market became very dull, many of the mills closed, and in exceptional cases as low as 5s. was accepted in the early part of December for inferior qualities. Towards the close of the month, hard weather and heavy falls of snow caused a revival in the demand, and the price again went up to £10 15s. to £11 10s. per ton. During the last fortnight, stocks in the mills are considerably reduced, and with every prospect of a good demand it is not improbable that the price will further improve.

RAPESEED AND ITS PRODUCTS.—The import of Rape and Rubens was considerably in excess of previous years, being 74,706 qrs., against 45,013 in 1859, and 23,074 in 1858. A very large proportion of this import was composed of the latter seed from Dantzic and Stettin, which gradually gains favour with our crushers. There was little doing in the beginning of the year, crushers being almost the only holders of Seed, and the quotations were almost nominal. An advance of 2s. per qr. on Seed, and a corresponding one in Oil and Cakes, took place in February, in consequence of the increased duty on the export of Olive Oil from Naples, but by the end of April prices had nearly resumed their previous standard. A slight advance occurred again in May, when Seed was quoted 60s., refined Oil £48, and Cakes £5 10s. per ton. In July considerable transactions took place in New Baltic Seed at 60s. to 61s., for delivery in October. The new Seed began to arrive freely in September, when prices rather receded, and during that and the following month 61s. was the value of good dry Seed, £45 10s. Oil, and £5 15s. to £6 for Cakes. Prices of Seed afterwards again advanced in November to their highest during the year, say 63s. for Rubens, 64s. to 64s. 6d. for Rape, Oil being £45, and Cakes £6 5s. to £6 10s.; since then there has been no alteration of moment in any of these articles, and the year closed at 62s. to 63s. for Seed, £41 10s. for brown, and £44 10s. for refined Oil, and £6 5s. for best green Cake.

FLAX.—The total import of Flax during the year amounts to 18,274 tons, against 13,695 tons, 17,913 tons, and 19,466 tons the three previous years; and of Tow and Codilla to 2,554 tons, against 3,968 tons, 3,252 tons, and 3,381 tons in the years 1859, 1858, and 1857. In the early months of the year the buyers of Flax acted cautiously, being under the influence of the reports that the supplies to be brought down to the Russian shipping ports, especially to Riga, would be very considerable. In the months of March, April, and May there was a continued good demand at fair prices. At the end of May the Riga market somewhat declined, which produced a corresponding reduction on this side during the month of June. The demand, however, remained steady. In July and August prices revived both at home and abroad, and fears were beginning to be felt that the future supplies would be much less than had been anticipated. The months of August and September brought an active demand, with an upward tendency in prices. Towards the end of October the value of Flax advanced 40s. to 60s. per ton. The higher rate in discounts did not affect the advanced prices of Flax, which continued to prevail to the close of the year, the market leaving off with much firmness, while stocks in first hands are in a limited compass. The total import of Flax into the United Kingdom for the first eleven months of last year is 65,196 tons, against 66,658 tons same period in 1859.

HEMP.—The import of hemp into this port amounts to 5,168 tons (viz., 2,940 tons from St. Petersburg, and 2,228 tons from Riga), against 4,028 tons in 1859, and 4,159 tons in 1858. There have also been received 541 tons of Russian hemp yarn. The prices were steady for clean hemp at about £29 per ton, with a good demand from the beginning of the year up to the middle of October, when it became certain that the import of the year must fall very short of 1859. In consequence the price of clean hemp rose to £35 per ton, at which rate many transactions took place. Since then the market has receded to about £34, with small stocks remaining. Although there is an excess in the quantity of hemp imported into Hull this year, yet the total import into the United Kingdom for the first eleven months of the year exhibit a deficiency of 19,867 tons, being 31,642 tons, against 51,509 tons for the same period in 1859.

OLIVE OIL.—The import this year has been 5,015 tons, against 5,200 in '59, 4,400 in '58, 3,410 in '57, and 4,920 in '56. As was anticipated in the last annual report, prices have continued very steady during the year, notwithstanding the Neapolitan Government twice made large additions to their export duty, and subsequently as suddenly took them off again; yet the fluctuations caused thereby, as well as by large exports in the autumn to Constantinople, were very trifling, Gallipoli having ranged between £58 in January to £60 to £61 in December, which latter price is likely to continue for some time, if we do not see an advance arising from small remaining stocks here, and short crops at the shipping ports.

CATTLE BONES AND BONE ASH.—The import last year was 12,614 tons, against 20,381 in '59, 16,908 in '58, 10,297 in '57, and 16,200 in '56; thus showing a deficiency of 7,767 tons less in '60 than '59, also 2,543 tons less than the average import of the previous five years. The short imports this fall arises partly from the effects of the large importations of grain, in many cases amounting to a prohibition on their shipment. The prices ruled steady during the season, ranging from £5 5s. in January up to £5 10s. in the middle of May; the supplies then being liberal, prices gave way to previous rates; subsequently, owing to the rise in freights, imports rapidly fell off, and prices advanced to £5 17s. 6d.; buyers, however, holding off, 2s. 6d. to 5s. less has latterly been taken. The continued high rates of freight, and the closing of the Baltic and continental ports, are likely, however, to curtail supplies for some time to come. The stocks are about much the same as last year, say 1,800 tons bones, and 1,000 tons bone ash.

TAR.—The movement in this article has been an extraordinary one, inasmuch as, owing to a deficiency of supply, not only at this, but at other large consuming ports also, the value thereof has more than doubled itself as compared with the average price of the last five years. The small stocks in second hands were exhausted long before any of the season's regular imports from Finland took place; and the price, opening at about 19s., gradually advanced to 30s. in November, when, on somewhat larger imports in London taking place, the price receded 2s. per brl.; a similar reduction in the value was consequent upon the few transactions that occurred here, and a parcel of Jacobstadt is reported to remain still unsold upon the market. The total imports reach about 14,450 brls., against 21,870 brls. in 1859, and 26,810 brls. in 1857. Stocks remaining over in first hands small, and the value 29s. to 30s. per brl.

TIMBER.—The timber trade has been remarkably steady throughout the year, the importation not being excessive, and the consumption being much of the same character, leaving the stocks in hand not in excess of those of last year. The most remarkable feature during the year was that of the alteration of the duty, which took place in February, by which timber and deals of foreign produce were reduced to the same rate as that chargeable on colonial. The effect on prices, however, to the consumer has been less than was anticipated: the shippers of European produce immediately increased their demands, and though they may not have realized the full amount of the reduction, they have no doubt obtained higher prices than they would otherwise have done. At the same time, it opened the market for the shipment

of lower qualities of European produce, the importation of which has considerably increased during the year, particularly from ports where the rates of freight are low. The importation to Hull is more than that of the previous year, and would have been still greater; but many cargoes were sent into Hartlepool by Hull merchants, in consequence of the inducements which the Hartlepool and North Eastern Railway Companies have held out by making low rates for landing charges and for conveyance into the interior of the country. The sleeper trade has not been of a satisfactory character, the competition has been such as to render it generally unprofitable, particularly when met, as it has been this year, by an advance in freights during the Autumn. A reference to the prices current will not show any great change in the value of wood goods generally.

SHIPPING.—The year 1860 opened with flatness in the colonial lumber trade, and the early engagements were made at 30s. to 31s. dd. per load for Timber from Quebec, and 77s. 6d. to 80s. per standard for Deals from the lower ports. The early Baltic rates were also unremunerative, and business was done for the first voyages at 15s. Memel, 45s. Wyburg, 40s. Cronstadt, 60s. Upper ports in the Gulf of Bothnia, and 52s. 6d. from the Lower Gulf Ports. From Riga 3s. 7½d. per qr. Linseed was paid, and from Archangel 4s. 9d. As the year progressed, it became evident that the discouragement the shipping interest had been subjected to of late years, and the numerous losses of vessels which had not been replaced, were beginning to make themselves severally felt in the freight market. Freights gradually advanced until the closing transactions on this side reached 38s. Quebec, 95s. Low Ports, 60s. Wyburg, 70s. Lower Bothnia Ports, &c., while on the other side still higher rates were readily obtained. A very noticeable feature during the year has been the constantly increasing number of engagements of tonnage for Hartlepool and Grimsby, which would have been taken for Hull if proper means had been used to encourage the trade of the port. This circumstance demands the utmost and most serious attention of every individual interested in the town and trade of Hull. The future wears a more promising aspect for shipowners than has been the case for years, and every facility should be afforded for the realization of their hopes, in order that this important branch of commerce may speedily revive, to the great advantage of the inhabitants of the port.

Hull, Jan. 1.

P. BRUCE,

Secretary to the Hull Chamber of Commerce.

ANNUAL REPORT OF THE LIVERPOOL WOOL TRADE.

LIVERPOOL, December 31, 1860.—In taking a retrospect of the past year, we are happy to say the Wool Trade, on the whole, has been in a very satisfactory and healthy state. In the early part, political events abroad, and to some extent also at home, and subsequently serious apprehensions for the harvest, had a somewhat depressing influence, and induced all parties to act with great caution. This feeling has continued more or less throughout the whole twelvemonth, and greatly tended to impart to our trade that stability and soundness which so favourably distinguish it at present.

The exports of Woollen Manufactures show again an increase, as compared with the previous year, amounting to upwards of £1,000,000 more than in 1859—hitherto the largest year. The consequence has been, a steady and profitable employment of the manufacturing population in this branch, which has thus been enabled to become again good customers to the home trade.

The Raw Material, so far as regards the yield of last year's clip of home growth, has proved materially deficient, owing to the severe and protracted winter, and consequent mortality among sheep. This deficiency has in some degree been supplemented by an increase in the Imports of Colonial and Foreign Wools, which are unpre-

cedentedly large, exceeding those of the previous year by about 58,000 bales, or 12,000,000lbs.

The Exports of Colonial and Foreign Wools have also been larger than in 1859 by about 600,000lbs., whilst those of Homegrown Wools have been larger by no less than 2,500,000lbs., owing, no doubt, to the alteration in the French tariff.

AUSTRALIAN.—The total imports show an increase of about 14,000 bales. The bulk has, as usual, been disposed of at public auction in London, at the following four series, viz.:

	Australian. Bales.	Capes. Bales.
From March 1 to March 20..	35,987	13,209
„ May 3 to June 1..	67,911	8,847
„ July 19 to Aug. 30..	88,639	10,224
„ Nov. 15 to Dec. 7..	45,576	21,138
Together..	238,113	53,418

The condition of Australian has been about the same as in the preceding year. During the first three sales, prices, taken on the average, did not undergo any material change; but at the last series, an advance of fully 1d. per

lb. having been established, present rates must be quoted that much higher than at this time last year.

CAPE WOOLS show but a trifling improvement in price; and the condition still leaves much to be desired. The imports amount to upwards of 19,000 bags more than in 1859, which year showed a considerable decrease as compared with former years; however, this apparent falling off was not owing to a real decrease in growth, as might have been inferred from our last annual report, but chiefly to a larger portion than usual having been exported to the United States and other markets.

GERMAN.—The imports have again decreased, being only about half the quantity of what was sent to this country in 1859, which, owing to the disturbed state of continental politics, was an unusually large one.

SPANISH AND PORTUGAL.—The supply of the former has been considerably larger than for some years past, consisting, however, chiefly of unwashed and black wools, which are not of very current sale. The arrivals from Oporto and Lisbon have been nearly double those of the previous year, and four times as much as in 1858. Oporto Fleece has been in good demand throughout the year, at improving prices, and in a great measure as a substitute for English wools, which are now comparatively higher than for many years past, owing, no doubt, to the deficiency in the clip, as well as to the increased demand consequent upon the late French tariff. The lower grades of Oporto have also met with ready sale, at prices without any material change. Lisbon, until recently, has been rather slow of sale.

UNITED STATES.—The imports (of 3,180 bales) have been principally the growth of Canada, of long-stapled description, and very well adapted to compete with English wool. The getting-up and its condition have not been all that could be desired; however, with a little more care and attention on the part of growers, this class would be found best suited to supply the increasing wants of our domestic wools of this kind.

BUENOS AYRES.—There has again been a great falling off in the imports; but we have had a very good inquiry, and our markets are quite bare of stock. The same applies to Cordova, the small parcels that have come to hand having found immediate buyers, at full rates.

PERUVIAN AND ALPACA.—The imports of Sheep's Wool show a considerable decrease on those in 1859; and as this description has been in active request, the arrivals have met with immediate sale, at gradually improving and comparatively high rates; and stocks are, consequently, in very narrow compass. Alpaca has arrived in larger quantity than ever, the imports being 10,000 ballots in excess of 1859. The demand has been principally for the best qualities; and stocks have been light throughout the year, as importers have met the demand by making, from time to time, considerable sales "for arrival."

EAST INDIA shows a very material increase in the imports, which have almost exclusively been directed to this port, and have formed the chief attraction at our public sales during the year, of which we had four series, viz.:

	Bales.
The 1st, from Jan. 25 to Feb. 3, with.....	14,347
The 2nd, from April 18 to April 27, with	13,070
The 3rd, from June 27 to July 4, with	10,557
The 4th, from Sept. 19 to Sept. 29, with.....	18,560

In all (East India)..... 56,534

Prices have on the average been very well maintained, whilst the condition of these wools, generally speaking, has not shown any marked improvement, and the observations made on this subject in our two preceding annual reports are therefore applicable to the year's imports also.

RUSSIA.—There is a slight diminution in the arrivals. *Donskoi Fleece* has been in steady request during the year, and the increased consumption by our home trade, coupled with a demand from the United States, has moved off all the surplus stock, and the market is now comparatively bare, whilst prices are, on the average, fully 5 per cent. higher than at the same period last year.

MEDITERRANEAN AND EGYPTIAN.—Very little of the former has come to this country, the cost price at the shipping ports leaving little, if any, chance of profit to importers.

Egyptian has experienced a very good demand, but as this class is more or less influenced by the range of prices for *English Wool*, it has participated in fluctuation of value in an equal degree.

TURKEY GOATS' OR MOHAIR.—There has been rather less imported than in former years. During the first nine months of the year the demand was very fair, prime parcels commanding most attention, but for the last three months there has not been much animation, and although no reduction can be quoted for really good wool, inferior parcels could not be moved except at prices in favour of buyers.

ICELAND.—The supply has been rather short, but, in consequence of the high prices ruling for English Wools, the arrivals have found ready buyers at full rates.

BARBARY.—The prohibition of exports having been withdrawn by the Emperor of Morocco, as intimated in our last year's report, there have again been large arrivals from that quarter, amounting in all to about 9,000 bales, which have been readily disposed of at current rates, and stocks are, consequently, but light.

The supply of **DOMESTIC WOOLS**, owing to the circumstances alluded to in our general remarks, has been considerably short of former years, and we may safely put the deficiency down as at least 15 per cent., when compared with 1859. Upon to June last the trade continued to buy with the greatest caution and only for immediate requirements, with the view of supplying themselves at clip-time at more moderate prices. In this, however, they were disappointed, the wants of consumers being so pressing that they were compelled to yield to the high demands made by growers, and a large portion of the clip consequently passed into the hands of consumers and dealers at high rates. Since then, however, the demand on the whole has been sluggish, owing, in a great measure, at first to the bad harvest prospects, and, subsequently, to the unsettled state of monetary affairs, and the political difficulties in the United States, so that dealers have found it hitherto very difficult to realize a profit on their early purchases. **SCOTCH:** The stock of *Laid Highland* in this market had become very much reduced at clip-time; still consumers and dealers, remembering the remunerative result of their purchases at the fairs of the previous year, were anxious to buy at prices which promised to leave them a profit, and they succeeded at rather lower rates than last time. Nevertheless, prices having not materially improved since then, it has been quite as difficult to get a profit as before. There has been an average consumption, and before next clip the stocks are likely to be in a very small compass. *Laid Cheviot*, of the best class, was most in demand at the fairs, and principally taken by manufacturers.

The position of our market seems at present to be this: There is an increase in the imports of wool, according to the official trade returns, of 10 per cent., from which must be deducted an increase in the exports of wool of 9 per cent., thus leaving a net surplus of only 1 per cent.; against this, however, there appears an increase in the exports of manufactured woollen goods and yarns of 8 per cent., which, added to the deficiency in the home-growth of 15 per cent., leaves the supply of wool 22 per cent. short of that of 1859.

The arrivals of **SHEEPSKINS** have been inconsiderable. Heavily woolled and good-conditioned parcels have commanded very full prices, whilst short and light-woolled skins have been more difficult to move. Stocks of all kinds, however, are very low.

R. W. RONALD & SON.

RUFF'S GUIDE TO THE TURF.—The establishment of *Ruff's Guide* marked a new era in the history of the Turf. The standard "list of subscribers" to *Weatherby* was found no longer sufficient for those even directly interested in the essentially "popular" pastime of the country. To meet, then, the wants of a new class of sportsmen, a new work had to be provided; and this, fortunately, came with such a *prestige* as to ensure its authority at once. The *Guide*, moreover, had especial commendations of its own. Although small, it was

complete; and if voluminous in its information, it was equally handy in its arrangement. The present editor, who is well up in his subject, has been careful not to lose sight of the good model the originator of the book set up; and the turfite, once familiar with "Ruff," is satisfied so long as he sees no material change in its disposition. The "winter edition," now just out, has, of course, all those features for which the *Guide* has ever been famous. The races past and to come; the performances of two-year-olds; the laws of racing; the lengths of courses; Derby lots; a list of trainers; and that very useful compendium, the winners of all the "events" of any note, from the time of their establishment. Comparatively, "Ruff" is rather late in the field; but this has been attended with some concomitant advantage to its supporters. It is more clearly printed than of late, and has altogether a neater look; while the delay has enabled the editor to include the "assumed names" which appeared a few weeks

back in our columns—the mysterious Halls and Henries and Thomases, who exert so much influence, but that so seldom turn up in the flesh, or the "fashionables present." Another fresh point is the bit of French news (also extracted from our columns)—the Derby and Oaks nominations over the water, with the names of the trainers, and what any of them have done so far. Could not this be yet further improved upon? In these times, when English horses are running abroad, and French nags finishing up for the Derby, and closer still at Newmarket, a few leaves of foreign sport would be very acceptable. It is impossible, thus early, to get a correct list of jockeys, for their lowest riding weights; and "Ruff" reserves his, as heretofore, for the spring edition. Those who have awaited the appearance of their old Mentor will not be without their reward, for *Ruff's Guide to the Turf* is still worthy of its title and its previous good name.—*Bell's Life in London.*

THE PROVISION TRADE. ANNUAL REPORT.

In reviewing the provision trade for the past year, we are again led to the important fact, that the consumption of provisions going on in this country swallows up all the supplies which the whole of Europe and America can spare; and we notice particularly that butter, cheese, and bacon have commanded higher values than have ever before been realized; even before free trade, and when the United Kingdom was mostly dependent upon itself for feeding its population. We have had (in addition to the supplies from Ireland) butter and cheese from Holland; butter, cheese, and bacon from America; butter and bacon from Germany, and butter from France; yet still prices have ruled so high, that scarcely any room has been left for the dealers in these articles to make a fair profit between the producers and the consumers, and it is consequently doubtful whether the trade generally is better or worse for the year's business.

Comparative Imports and Deliveries of Irish and Foreign Butter into London, 1859-60.

	IRISH.		FOREIGN.	
	Imports.	Deliveries.	Imports.	Deliveries.
	Firkins.	Firkins.	Casks.	Casks.
1860.....	135,486	112,391	740,647	616,686
1859.....	229,236	204,228	424,716	374,613

Lard is also an article worthy of notice, being used for so many besides culinary purposes. Supplies have, in addition to those of Ireland, been received from Germany, Italy, Austria, and America to a surprising extent, as will be seen by our summary of the imports. The price some few years since was considered high at 40s. per cwt., but this past year it has ruled from 60s. to 70s. per cwt., the latter extreme being the present currency.

Comparative Imports of Lard (from all places) to London and Liverpool.

	From Oct. 1st, 1859 to Sept. 30th, 1860	Tons.
Ditto 1858	ditto 1859	8,771
Ditto 1857	ditto 1858	6,560
	ditto 1857	6,048

In salt beef we have to notice some remarkable fluctuations. The market opened at from 100s. to 150s. per tierce, but supplies being excessive from America, and likewise from Russia, which latter country has lately entered into competition, the market declined to 70s. and 100s. per tierce; and this fall in value has continued in face of exceedingly high rates for fresh meat in all the markets of England, the stocks on hand being very heavy. We subjoin the comparative imports of beef for the last three years, by which it will be seen that the last year has been in excess of the former one by nearly 30,000 casks, equal to 18,000 head of cattle, the total quantity being equal to between 50,000 or 60,000 head of cattle; a wonderful fact, when we reflect that only a few years since Ireland alone furnished all the cattle for salting, which are now, by the aid of steam conveyance, chiefly sent to this country alive, or are consumed there as fresh meat. The increase of consumption of fresh beef is also very striking; upon referring to the im-

ports of live cattle from Germany, Holland, and Spain (a comparatively new trade), we find they amounted this year to the large number stated below; yet the market fully maintained its high price, until from the scarcity of winter food, arising from the unusually bad season for root crops and fodder, made it imperative upon the graziers and farmers to send their beasts to Smithfield, whether lean or otherwise; from which latter fact we may infer that meat will again rule unprecedentedly high this coming year, from the growth being prematurely forced to market.

Salt pork has maintained the opening price of the season, 85s. to 100s. per brl., as this description of food has been scarce everywhere, both at home and abroad; added to which the Government contracts for the navy have been unusually large, equal to about 60,000 brls., of 208lbs. each, the average price for which is £6 6s. per brl., the whole of the cure of Ireland, Hamburg, and Dantzic, and which is now being salted. This article may, therefore, be expected to rule very high, and consequently to cause bacon to be the same; but whether the price will be as much as was paid at one time in the year for Irish bacon (80s. per cwt.), is still a question to be solved. The only circumstance which may possibly reduce the price of pork for our mercantile marine is the disordered state of American politics, which has caused a fall in the United States of from 20 to 30 per cent.; but how long this state of things may last is quite uncertain, for should matters be settled there, a recurrence to high rates is sure to immediately follow, as their paper money, when credit is good, enables both producers and speculators to raise prices to any pitch that the wants of their foreign customers may necessitate them to pay

Comparative Statement of Imports of Beef, Pork, and Bacon (from all places) to London and Liverpool, 1857-60.

	From Oct. 1, 1859, to Sept. 30, 1860.	Oct. 1, 1858, to Sept. 30, 1859.	Oct. 1, 1857, to Sept. 30, 1858.
Beef....	86,977 tcs.	59,581 tcs.	55,169 tcs.
	8,124 brls.	11,499 brls.	8,508 brls.
Pork ..	16,041 tcs.	15,592 tcs.	11,898 tcs.
	65,638 brls.	91,991 brls.	54,840 brls.
Bacon..	18,080 tons.	12,472 tons.	13,234 tons.

Comparative Statement of Imports of Live Cattle, &c., into the United Kingdom, 1858, 1859, 1860, from 1st January to 30th November in each year.

	1860.	1859.	1858.
Oxen, bulls, and cows	60,225	57,863	56,463
Calves	21,621	20,675	24,727
Sheep and lambs ..	243,493	230,026	156,737
Pigs	20,035	10,360	10,530

It may also be a question for the financier whether the large influx of the precious metals for the last ten years may not have had considerable influence in creating high values for food, independent of the large consumption; and if so, whether all paper money unrepresented by bullion is not adding to this evil, and taxing all classes of the community, by raising prices.

EDMUND PHILLIPS & SON.

London, December, 1860.

THE MANURE TRADE.

At the commencement of another year we feel a few observations on the state and prospects of the Manure Market are not out of place. When we consider that twenty years since, the use of artificial manures was scarcely known, probably no trade in so short a time has been more extended or produced greater results.

The importations of Guano have gone on increasing from a few tons about the years 1836-7, to quantities varying from 200,000 to 300,000 tons per annum. The manufacture of superphosphate of lime has progressed in a corresponding manner, fully proving that with judicious use these two important manures yield a profitable investment on the land. During the last year a large amount of business was done in most kinds of manure, but owing to the wet and cheerless character of the spring and summer, the results have not been so profitable as in former years, the root crop in most parts of England having proved a comparative failure; but in Scotland, where artificial manures are most extensively used, the season has been more genial, and the produce of the land much more abundant.

There is a growing desire to have manures of high quality, more especially in superphosphate of lime, and the use of bones and bone-ash in its manufacture, is considerably greater than in former years; but purchasers must not expect to obtain a high standard of quality at a low price. In the early part of the year the market was well supplied with raw material, both bones and bone-ash, but the increased demand during the last three months has caused a considerable rise, which will probably be maintained for the present season.

Nitrate of soda is now lower, and the stock larger than has been the case for some years; it offers a fair prospect of being used with profit in the spring.

Greater attention is now being directed to the improvement of pastures, and probably no money expended on the farm yields a more certain return than the use of bones, and those manures containing phosphates (if partly dissolved, the better) to exhausted grass lands, and it is expected there will be a very large demand as soon as the time arrives for their use, which should be about February.

In reviewing the trade for the past year, though we are aware of numerous disappointments, the result of wet and cold weather, still we feel there is an increasing disposition to extend the use of all really valuable fertilizers, and we look with great confidence to the future.

E. PURSER, Secretary.

London Manure Company, Jan., 1861.

CENTRAL FARMERS' CLUB.

The following subjects have been appointed for discussion during the year 1861:—

February 4.—The Past, Present, and Future of British Agriculture.—To be introduced by Mr. J. J. Mechi, Tiptree Hall, Kelvedon.

March 4.—The Several Merits of Day and Piece Work.

April 1.—Sheep v. Bulls as Manufacturers of Manure.—on Farms where the Produce is not fattening, and no roots but Mangolds can be grown.—Mr. A. Ruston, Aylesby House, Chatteris.

May 6.—By what means can the Feeding of Stock on Pasture Land in Spring, Summer, and Autumn, be so increased as to supply the demand of an increasing population?—Mr. Owen Wallis, Overstone Grange, Northampton.

June 3.—The Vegetable and Animal Kingdoms, in their mutual relations, as bearing on the science of Practical Agriculture.—Mr. J. G. Hobson, Long Sutton, Lincoln.

November 4.—How Under-drainage affects, and by its extension will further affect, the Arterial Channels and Outfalls of the Kingdom.—Mr. J. Bailey Denton, Stevenage.

December 9.—Would it be advisable to abolish Parish and to substitute Union Settlements in the Agricultural Districts?—Mr. H. Trethewy, Silsoe.

FERTILIZERS.

RETROSPECT OF THE PAST YEAR.

BONES.—The imports, from the River Plate especially, being greatly less than the previous year, prices of all sorts have gradually advanced 15s. to 20s. per ton, so that £5 12s. 6d. is now the asking price for floating mixed cargoes. The leading manufacturers of manures, however, are now well stocked for a time.

BONE ASH.—The stock with which we commenced the season has been nearly cleared out, and the collapse in the hide and leather trade, together with the U. States' demand reducing supplies from the River Plate, prices have gradually advanced since May from 17s. 6d. to 20s. per ton; and on the basis of 70 per cent., for floating cargoes £5 10s. is now paid.

CRUST PHOSPHATES OF LIME.—The United States demand has mainly absorbed the shipments from Sombro, &c., and though the Spanish are coming more into favour, the uncertainty of a continuous and sufficient supply deters manufacturers of Phosphorus and Phosphates from adapting their appliances to its use. We are glad to report the success of our efforts with the Board of Trade and the Mersey Dock &c. Trust, in getting the import dues on this new article of commerce much reduced.

COPROLITES, too, have advanced a little; but being still the cheapest source of Phosphates, a large trade has been done, and some new pits have been opened in Cambridgeshire.

ANIMAL CHARCOAL.—For manure manufacture the stock is very small, and but little coming from the Continent.

GUANO.—The new arrangements of Messrs. Zarracondigui and Co. will not be perfected for some time for the New Peruvian contract; but as the present large import from the Chinchas can hardly continue many years, prices cannot be expected to be lower. The import of Kooria Moorla and other low qualities has ceased, being unprofitable; but the Bolivian or Upper Peruvian from San Filipe is coming in considerable quantities, owing to present low freights, but it varies much in quality.

BRIMSTONE.—The Italian revolution for a time interrupted the supplies, but now the eleven months' imports are 42,600 tons, against 47,400 tons same time 1859, and after several fluctuations it is now 10s. per ton dearer than this time last year.

SULPHATE AMMONIA.—The demand quite keeps pace with the increased production, and prices have varied little from our quotations.

PYRITES.—With the increasing demand for Acid this has become an immense trade, and we are now drawing supplies from many new sources in Spain, &c., and one sort being in combination with iron, has the advantage of being quite free from Arsenic; but for the present the great advance in grain freights cut off these distant supplies.

ACIDS have fluctuated very little, and we are now open to contract for delivery on the Dee or Mersey at 85s. per ton for Brown Sulphuric, 142 degrees, and Muriatic at 10s. per ton, without Carboys.

NITRATE OF SODA.—Owing to the many ships seeking return freights from the Pacific coast, a very large stock has kept accumulating, so that the eleven months' imports into the United Kingdom are 85,000 tons, against 23,500 tons same time 1859, and prices have fallen 2s. 6d. per cwt.; but this is greatly increasing its manufacturing uses, and inducing a large consumption. Nothing more has been reported of the large deposit found in Brazil.

FEEDING CAKE.—Though the imports of all kinds have been 90,000 tons, against 76,300 tons the previous year, and our own home make much increased, stocks are very light, and prices have risen 30s. to 40s. per ton, and both Cottonseed and Rape Cake are coming into more general use.

Liverpool, Jan. 1.

ARNOTT BROS. & Co.

SUFFOLK AGRICULTURAL ASSOCIATION.—This society, which is in a most flourishing condition, will hold its meeting for 1861 at Ipswich, July 5. With a view to popularize the exhibition as much as possible, the admis-

sion charge is to be graduated as follows : between ten and twelve o'clock, 2s.; between one and two o'clock, 1s.; and after two o'clock, 6d. The society's premium for engine-drivers has been withdrawn, it not being practicable to make the awards satisfactorily. With regard to the sheep prizes, some difficulty being experienced in defining the meaning of the expression "park-fed," the words are for the future to be struck out. The horse premiums are to be increased, Suffolk being deservedly proud of its horse stock. With reference to the stallions, it was proposed to strike out in the prize-sheet the words "thorough-bred" in the riding or

carriage-horse class, but the Earl of Stradbroke protested against such a proposition, as he was anxious, he said, to discourage a breed of horses which ran about eight miles an hour, and wanted to call at the first public-house they came to. The prize of £10, offered by Lord Henniker, for the best essay on the improvement of pasture-farming in Suffolk, has been awarded to Mr. R. Bond, whose composition will be printed. The finances of the society are in an excellent state, a balance of £614 in hand testifying to the excellence of the management, and the general interest felt in the association throughout the district.

FARM OPERATIONS FOR FEBRUARY.

In this short paper I purpose giving a few plain directions relative to farm practice for the ensuing month; more particularly suggested by the almost unexampled season from which we have, I trust, just emerged. Field culture has of course been entirely at a stand, and in consequence all such operations are very backward. The cartage and thrashing departments, however, are in a very forward state, so that ploughing and other field-work which has been delayed by frost may now be proceeded with.

The first and most important operation to be now prosecuted is the sowing of wheat. To this all others must give way, and at every favourable opportunity, the state of the soil and weather permitting, it must be attempted. I am old enough to remember the season of 1814-15. The frost did not at that time subside sufficiently to permit free seeding till the latter end of March or beginning of April. Much wheat was then sown, and owing to an untoward season for wheat-growing a wretched harvest was the result. The bulk of straw and thinness of grain outdid the yields of last year. Our aim must be to avoid if possible any approach to a similar disaster: hence, I say again, take every favourable opportunity to get in seed, provided (for that must ever be the grand aim) it can be got in well. We have the experience of the past forty to fifty years upon which to fall back. In this time we have had great improvements in wheat growing. We now know that it does not require all soils to be in the finest possible condition to produce a good crop of wheat. Often the richer the soil the poorer the crop—"all straw, little grain." Farmers are more convinced on this point, and now go to longer lengths in rotations, to which landlords readily agree. This is the very season to put a farmer's judgment to the test. Why sow wheat at all at any hazard? Other crops may advantageously intervene. In this age of artificial management and artificial manurings rotations ought to be abrogated, and the intelligence of modern farmers substituted for all that is obsolete and restrictive. Farmers have, in fact, to buy their crops of the cake or the manure dealer, and they ought to have them, *i.e.*, crops of grain, not crops of straw.

We have also the further experience of improvements in the culture of wheat and other grain. The innumerable "new varieties" brought into the market is astonishing; and out of them every farmer has annually to make his selection. Now, cannot something suitable be selected for this season? The nursery wheat has a short wiry straw, very thin and stiff, with white chaff and a small red berry of slender oblong form, and is perhaps the heaviest wheat grown per bushel. This I see is highly recommended. I have grown it two or three times, but found it rather behind some of our favourites for regular growth and produce. The white Jersey wheat of Col. Léconteur, which I grew some years ago, would, I think, do admirably for such a season, being very short in straw and wiry, with pretty

plump grain. It may be obtained in Jersey, I doubt not. The hoary or velvet-chaffed white would do well if drilled widely apart, certainly not nearer than ten inches. The bearded April wheat should by all means be selected for April sowing: one of the best crops ever known was from the variety sown upon Old May-day (as I have been told). It yielded upwards of six qrs. per acre, and made six guineas per quarter. The Talavera or Spanish varieties may prove acceptable this year. Can any one tell us of foreign varieties which are generally sown under similar circumstances? Importations from Sweden, for instance, or North Russia or Canada? Growers in these countries have no doubt considered this subject long ago, and have adopted salutary precautions. We must obtain knowledge from them. Perhaps our own Orkneys or North Scotland could supply us with proper seed for this very doubtful season. No time must be lost in applying for it in any case. A variety possessing a short straw, and slow in its growth, should, as a general rule, be preferred.

In this next February, should the weather prove suitable, almost every grain crop may be sown—beans, peas, oats, and even barley towards the close of it. The land for beans or peas should be manured at the rate of eight or ten two-horse cart-loads per acre, and be ploughed-in two or three weeks prior to sowing. The chance of a frost to ameliorate the soil is thus sought for, and, if obtained, saves much labour in harrowing. The beans should be drilled thinly in rows ten inches apart. If the soil is in a good state, from six to eight pecks of good seed are amply sufficient. The chief end to be aimed at is to have every plant separate, so that the flowering process may go on favourably; and this distribution has on good bean soils been found to answer. If hoed out more singly, all the better. For peas a very similar course should be pursued; but they do not require to stand so singly. From ten to fourteen pecks of seed should be sown, as so many grains are defective; but if all are good, ten pecks will do well. Oats are generally sown on land from which a green crop has been fed off. This land should be ploughed as near up to the folds as possible, so as to retain the value of the sheep deposits. The drilling may be commenced at the latter end of the month in open weather. The rows eight or nine inches apart, and from eight to twelve pecks of seed quite sufficient. The heavier and better the seed, the less will suffice. Barley may be put in, but it is best to await two or three weeks longer, lest frosts should nip the tender blades.

The ploughing of the fallow lands will of course proceed at convenience, and in dry weather if possible, as they are then so much more readily worked. It is a good time to look over young clovers, to pick out the plants of twitch. Hollow draining should be completed in this month, so that all hands may be ready for the wheat-hoeing, and other spring work.

In stock management much attention will now be re-

quite. The transition of the sheep from turnips to mangolds will require careful watching, or much scouring will take place. Dry food in plenty must be given. Ewes will commence lambing in this month, for which every preparation should be immediately made. Cattle in fold-yards ought now to have an increased ration of cake; sheep also require an increased allowance, somewhat in proportion to their increased growth. All stock, as the days lengthen, will consume a larger portion of food: let this be borne in mind in giving them their daily allowance.

DURHAM COUNTY AGRICULTURAL SOCIETY.

An intimation having been received by Mr. Mewburn, chief-bailiff of Darlington, that the Durham County Agricultural Society had decided at their annual meeting, a few days ago, to hold the ensuing show at Darlington, providing £50 were raised to meet the expenses, a meeting was called by circular for the purpose of taking the matter into consideration. The only opposition the proposal met with was from Mr. Jos. Dent, of Neasham, who, himself being a practical farmer, expressed his belief that farmers in the immediate neighbourhood would be more directly benefited by a local show. He had grave doubts, indeed, whether tenant-farmers got any benefit whatever by subscribing to the county show; for he had no hesitation in saying that from defective rules—he could ascribe it to nothing else—the subscription-money, which by those gentlemen who subscribed was meant solely to give an impetus to or help in the improvement of agriculture, went to no other purpose than to enrich a few individuals, who made a complete trade of exhibiting at all the shows where great prizes were offered throughout the country. A tenant-farmer had no chance with them. There was no encouragement held out to him whereby he might be induced, at great expense and trouble, to travel twenty, thirty, or more miles with his stock, however superior that stock might be as compared with his immediate neighbour's, or however much that superiority had resulted from his own watchful care and breeding skill. The great bulk of the prizes went into the pockets of Col. Towneley, Lady Pigott, Capt. Gunter, Mr. Fawkes, Mr. Booth, Mr. Ambler, and a few other celebrated breeders, who absorbed from £10,000 to £40,000 of the subscriptions. If you went to the Royal Society's meeting, there you would be sure to meet with one or other of all of them. If you went to the Great Yorkshire, the same; indeed, they exhibited at every show where great prizes were to be won. If a tenant-farmer should be bold enough to seek the services of one of their bulls, he received the answer, "We don't serve cows with our bulls"; and if he proffered to buy a calf, it was either bespoke, or the party was not inclined to sell. Not a single iota of benefit, therefore, in a direct way was got by the tenant farmers, where they were allowed to compete, under present circumstances. According to old rules, prize bulls were compelled to serve in the immediate district where the prizes were won; and exhibitors who refused to be bound to those rules rendered themselves ineligible to compete.

It was ultimately decided to accept the offer of the Durham County Agricultural Society; and a local committee having been appointed, with H. Pease, Esq., M.P., at the head, was directed to recommend to the Society to make such alterations in their rules as would meet the requirements of tenant-farmers.

The income of the Society for the past year has been £785; the expenditure £601, leaving £184 in the treasurer's hand. Seven of the retiring members of the Council have been re-elected, Mr. Joicey, of Tanfield, was chosen in the stead of Mr. T. Wearmouth, who declined to stand.

ESSEX AGRICULTURAL SOCIETY.—The first meeting of the new Committee of this Society was held at the Shire Hall, Chelmsford, for revising the schedule of prizes and fixing a day for holding the exhibition of the

present year. The President, Sir Thomas Barrett Lennard, Bart., was in the chair, and there were present T. W. Bramston, Esq., M. P.; Lieut.-Col. Ruggles Brise; D. McIntosh, Esq.; Rev. John Cox; G. D. Badham, Esq.; J. Oxley Parker, Esq.; W. Fisher Hobbs, Esq.; Thos. Mashiter, Esq.; Messrs. John Clayden, W. Hart, James Christy, E. Catchpool, W. Sworder, J. G. Fenn, F. Whitlock, P. Portwey, and C. Sturgeon. Mr. W. Fisher Hobbs moved that a sum not exceeding £100 be appropriated for prizes during the present year. Mr. Peto Portwey seconded the motion, which was carried unanimously. The following prizes were open to all England:—£25 for the best Cart Stallion, £25 for the best Thoroughbred Stallion, £15 for the best Bull, and £10 for the best Ram. The day of exhibition, to be held at Romford, was fixed for Tuesday, the 25th June.

STAINDROP FARMERS' CLUB.

The annual meeting of the Staindrop Farmers' Club was recently held, when the finances were reported to be highly satisfactory, and the general state of affairs most encouraging. Many of the most influential farmers of the district are members, and principally through their influence and efforts, an enlightened tone has been given to agriculture and its numerous associations. Numbers of valuable papers, bearing on all manner of subjects, but principally on what concerns agriculture, have been periodically read at the Club meetings, and many good results have followed.

The dinner was purveyed on this occasion by Mr. Simpson, of the Queen's Head, Staindrop, and was attended by Mr. T. F. Scarth, steward to his Grace the Duke of Cleveland, and numerous other gentlemen, principally composed of his Grace's tenants. The proceedings were of a really interesting character, and well calculated to promote the object for which those clubs are formed—the improvement of farming.

NORTHAMPTONSHIRE AGRICULTURAL SOCIETY.—A special meeting of the members of this Society has been held at Northampton, to take into consideration a proposition from Mr. Owen Wallis, that for the future the annual show should be held in July instead of September, as at present. Lord Spencer took the chair, in the absence of the President, the Honourable Frederick Villiers, from whom a letter was read, stating he could not be present if the meeting were held in July, and that he should resign if it were so determined. Mr. Owen Wallis, in deference to this, consequently moved that the alteration he proposed should not take effect until 1862; and his motion, seconded by Mr. J. Beazeley, jun., was carried, in the face of two amendments, by a majority of nearly two to one. The show will this year be at Northampton; and we can only regret that the county town has not been allowed to inaugurate a change for the better. In the last week of June or the beginning of July there was the promise of a really grand day.

THE FARMER'S ALMANAC AND CALENDAR for 1861, being the year after Bissextile, or Leap Year. By CUTBERT WILLIAM JOHNSON, Esq., F.R.S., and WILLIAM SHAW, Esq. Continued annually.

London: James Ridgway & Co., Piccadilly. Edinburgh: A. and C. Black, and Bell, and Bradfute. Dublin: M'Glashan.

An Almanac is an indispensable book of reference to a farmer or gardener; and, when combined with agricultural and horticultural information of the very first order, as in the case of the "Farmer's" on the subjects most interesting to the cultivators of the soil, it cannot fail of being acceptable to them. The Index will show that it is a compendium of knowledge culled from authentic sources, and capable of practical application.

RUFF'S GUIDE TO THE TURF, FOR 1861 (Sporting Review Office, 246, Strand).—The recent offer of the Royal Agricultural Society, of £100 for the best thorough-bred

stallion, has already led to a deal of talk about good horse-flesh. Even, then, beyond mere racing purposes, "Ruff's Guide" comes as a very welcome authority. As usual, it has the fullest and most authentic intelligence on sport past and prospective, with the pedigree of every horse that was out last year, as well as the like information on

"the blood" of those coming on. The work abounds in Tables and Summaries, and "Lots" and Laws; and breeders will find it a really "handy book." Like the Shorthorn bull, the thorough-bred horse is the great improver of his kind; and in "Ruff" are written the records of his race.

CALENDAR OF AGRICULTURE.

Sow spring wheats on turnip lands cleared of the roots: and on dry warm soils sow oats, early peas, rye, and beans. Sow barley on turnip lands, and spring vetches on leys and stubbles, and the seeds of cabbages on well-prepared beds or borders, to raise plants to go to the fields in May and June.

Plough leys and stubbles in fresh weather; during frosts carry dung, earths, stones, and fuels, as may be required. Carry stones to drains and roads.

Continue the feeding of live stock as directed last month. Oilcake will now begin to be used: it much hastens fattening, and greatly improves the quality of the dung. Break or bruise the cake, and place it in troughs. Oats and salt are beneficially used along with it.

Remove all turnips from the fields by the end of the month, without delay.

Flood watered meadows, and lay dung on grass lands during fine weather; bush-harrow and roll the surface during dry weather, and pick off by hand any stones or rubbish that would impede the scythe. Repair fences and gates: spread molehills, and all tufts of dung on grass lands.

Dig hop grounds, open the hills, and apply strong manures, as the best rotten farm-yard dung rags, composts of lime, and salts. All oleaginous substances do well. Dress the roots, and cut off the shoots for use.

Continue the thrashing of grains, as the straw is wanted, and sell and deliver the corns; follow without intermission draining, and the subsoil ploughing of deep grounds.

Plant all kinds of useful forest trees, as oak, ash, elm, and larch. Set osiers in beds and in rows, on low damp grounds. Lay the beds dry by means of open dividing drains, and dig the ground one year before planting. Cut underwoods and fell timber trees during the whole month, and plant and repair old hedges, and plant new fences during moist weather.

Collect manures of every kind, and in every shape or form. Earthy matters mixed with decaying vegetable substances will never in any case disappoint the farmer; a compost heap for the reception of all such articles is a most indispensable requisite on every farm, be it large or small in extent.

CALENDAR OF GARDENING.

Prepare hot beds of small dung and vegetable refuse, rakings of grass and leaves, for forcing early crops, as asparagus and potatoes. Two objects are obtained—the preparation of much valuable manure, and the use of early crops and fruits, that would not otherwise be got.

The alternations of weather during this month, in frosts, snows, thaws, and rains, permit the operations of spade and fork in exposing the ground during many fine intervals. Peas, beans, carrots, parsnips, onions, and beet root may be sown on grounds duly prepared in the autumn management.

Asparagus beds are formed three yards wide, with four double rows, twelve inches asunder, and alleys between, and spaces on each side. The ground must be deeply dug, and very richly manured with the best farm-yard dung. Bone dust, salt, and guano, and pounded chalk, may be mixed in the beds, which are raised above the level surface, and left to settle down till Ladyday.

A similar preparation produces seekale, artichokes, and rhubarb, and for many years in succession.

Sow twice during the month, or oftener, spring spinach, lettuce, salads, and radish, and at the end onions, carrots, leeks, and some early cabbages,

Sow parsley in edgings or in beds, in yearly successions. Thyme and hyssop are also sown.

Prepare the best loamy soils for garlic and shallots.

FRUIT GARDEN.

Prune gooseberry and currant bushes: the buds will be breaking. Retain a quantity of young wood, spurring but little. Currants require rigid spurring, to produce the fruit in closer clusters. Retain about six canes to each raspberry bush. Cut the stems at the first bend, then collect and tie them at the summit. Mulch over the ground about the plants, but not dig the ground, and remove the wandering suckers.

Plant strawberries in beds or borders of deep ground, and use the kinds that are early, and also for a succession.

FLOWER GARDEN.

Sow the seeds of annual flowers in pots or pans in fine loams and earths; and placed under protection—lupines, sweet pea, dwarf-lychnis, candy-tuft, and navalwort, are good annuals: When planted on open grounds, a covering of rotten dung or fine earth may be laid over the beds as a covering, or renewed with fresh earths. But the common use seldom requires such applications.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR
JANUARY.

The long continuance of a very severe frost, and the improved condition of much of the new wheat in stack as a consequence, added to immense importations of wheat and flour from the United States and other sources of supply, have produced great heaviness in the demand for produce generally, and wheat has fallen in value about 4s. per qr. It is necessary that we should here observe that the rapid advance in the lowest price for money at the Bank of England to 7 per cent., and the refusal on the part of the directors to discount corn bills presented by Greek houses, have compelled many of the importers to sell rather than run the risk of a heavy loss upon holding forward. Both in London and at the outports the stocks of produce are unusually large, and it appears to us that we are completely overdone with supply for the present, consequently that prices will continue to recede; because we must bear in mind that, as yet, very little new English wheat has been disposed of, and that, after making due allowance for falling off in yield and condition, the quantity held is quite equal to last year at this period.

The barley trade has become much depressed, and the quotations have given way fully 2s. per qr., owing to the great heaviness in the demand for all descriptions of malt. There has been very little change in the value of other articles, though, of course, flour has sold on rather lower terms.

The quantity of wheat and maize in store at New York, at the latest advices, was over 4,500,000 bushels. By some persons it is apprehended that the bulk of this enormous supply will continue to be shipped for England; in that case, it would be difficult to understand where the present downward movement in prices will stop.

Out-door farm labours, in nearly all parts of England, are somewhat backward; and we regret to state that much of the land, originally destined to be sown with winter wheats, has lain fallow until now. This is a most unfortunate matter for the farmers; but the fact is that they were unable to get upon the land at the usual period, owing to its saturated condition. More wheat has been thrashed out than in many previous months. The severe frosts have greatly improved the corn in the stack; but the produce, as a whole, is a wretchedly poor one. Barley and beans are turning out much larger crops than was at one time anticipated. Advices from the continent state that wheat is offering on lower terms, and that the demand for all other articles is in a most inactive state; however, we may safely conclude that we shall receive heavy importations from that quarter after the re-opening of the navigation.

The cattle trade, almost generally, has been in a dull state, arising from the fearful amount of destitution in the metropolis; nevertheless, no change of importance has taken place in the quotations.

Great heaviness has prevailed in the demand for all kinds of English wool, at a decline in the quotations of 0½d. per lb. Foreign and colonial qualities, owing to dear money, have ruled very dull, and prices have shown a tendency to give way, notwithstanding that the stocks in the manufacturing districts and elsewhere are very limited.

A complete change has taken place in the state of the hop trade. The admission of foreign hops for consumption at a duty of 20s. per cwt. has been followed by a heavy reduction in the price of English. Foreign hops have come to hand in great abundance, and not a few of those from America and Silesia are equal in strength to our Sussex qualities. The supply of really fine new hops on offer is confined to a few pockets produced in Mid Kent. It is presumed in some quarters that the arrivals of foreign hops during the Spring will not be very large.

The supplies of hay and straw on offer have been only moderate. During the frost prices advanced to some ex-

tent; but since then they have given way. They may be thus quoted: Meadow hay, 2l. to 5l. 15s.; clover ditto, 3l. to 5l. 18s.; and straw 1l. 10s. to 2l. per load.

REVIEW OF THE CATTLE TRADE DURING THE
PAST MONTH.

Notwithstanding that only limited supplies of live stock have been on offer in the great Metropolitan Cattle Market during the month just concluded, the demand has been in a very inactive state, at prices about equal to those in December. The great severity of the weather, which has thrown thousands of people out of employment, has, no doubt, reduced the consumption of meat considerably, since it is quite clear that a fine open temperature, combined with very moderate supplies, must have enhanced the currencies considerably. It is gratifying to observe that both beasts and sheep have come to hand in better condition than for some time past, and that very few of the latter affected with the rot have made their appearance.

The northern season for beasts may now be considered as closed; hence we are now drawing upon the Norfolk supplies. Judging from the general weight and symmetry of the stock which has, as yet, reached us from that important county, it would appear that the past has been what may be termed a favourable season for fattening, even though the weather has been very changeable, and although a great scarcity of good sound food, for both beasts and sheep, is complained of. The Scotch bullocks continue to arrive in remarkably prime condition; but it is stated that the numbers destined for England this year are very moderate, when compared with many previous seasons.

The supplies of Irish stock have fallen off considerably, and their quality has, for the most part, been indifferent. Some of our correspondents state that large numbers of cross-bred sheep are undergoing the process of fattening for England. On the whole, the demand for sheep and calves has continued in a healthy state; but pigs have given way in price to some extent.

The present high range in the value of money in the discount market must, we are of opinion, operate against any rapid upward movement in the price of any kind of meat; indeed, inferior qualities will, we imagine, command a very moderate amount of attention, until after trade and commerce shall have become in a more wholesome state.

The severity of the frost has completely checked importations from the continent; but we understand that large numbers of both beasts and sheep (the latter chiefly crosses) are in process of fattening in Holland for the London market. The following figures show the arrivals into the metropolis:—

	HEAD.			
Beasts	..	..	..	1,094
Sheep	..	..	..	1,374
Calves	..	..	..	240

Total	..	..	..	2,708
Total in 1860	..	..	..	6,760
1859	..	..	..	9,264
1858	..	..	..	2,342
1857	..	..	..	4,633
1856	..	..	..	3,292
1855	..	..	..	9,102
1854	..	..	..	7,919
1853	..	..	..	12,847

The total supplies of all kinds of stock shown in the Metropolitan Market during the month are as under:—

	HEAD.			
Beasts	..	..	..	17,612
Cows	..	..	..	505
Sheep	..	..	..	75,240
Calves	..	..	..	677
Pigs	..	..	..	2,000

COMPARISON OF SUPPLIES.

Jan.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1860.....	20,500	535	92,425	1,078	2,045
1859.....	19,805	364	90,620	921	2,400
1858.....	20,312	572	80,742	1,108	1,759
1857.....	19,949	355	81,200	1,071	2,355
1856.....	17,532	435	101,600	757	2,930
1855.....	19,717	500	120,470	962	2,625
1854.....	19,687	510	95,080	887	2,279
1853.....	20,717	480	96,800	2,148	2,360

Beef has realized 3s. 2d. to 5s. 2d., mutton 3s. 6d. to 6s., veal 4s. 2d. to 5s. 6d., and pork 4s. to 5s. per 5lbs. to sink the offal.

COMPARISON OF PRICES.

	Jan., 1857.			Jan., 1858.		
	s.	d.	s. d.	s.	d.	s. d.
Beef, from	3	4	to 5 2	....	3	2 to 4 6
Mutton	3	8	to 5 6	....	3	4 to 5 4
Veal	3	8	to 5 0	....	4	0 to 5 4
Pork	3	8	to 5 2	....	3	6 to 4 10

	Jan., 1859.			Jan., 1860.		
	s.	d.	s. d.	s.	d.	s. d.
Beef, from	3	0	to 5 0	....	3	4 to 5 0
Mutton	3	2	to 5 2	....	3	8 to 5 6
Veal	3	4	to 5 2	....	4	6 to 5 8
Pork	3	2	to 4 2	....	3	6 to 4 10

From the above comparison, it will be seen that mutton has sold at a much higher price in the past month than in the corresponding period in several previous years.

The arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire have amounted to 8,360 Scots, shorthorns, and crosses; from the northern counties, 3,500 shorthorns; from other parts of England, 3,000 various breeds; from Scotland, 460 Scots and crosses; and from Ireland, 220 oxen and heifers.

Although Newgate and Leadenhall have been scantily supplied with each kind of meat, the trade, almost generally, has continued very inactive; nevertheless, no change of importance has taken place in the quotations.

SOUTH LINCOLNSHIRE.

We have now passed through a season of remarkable intensity, and the close of it is as favourable to the continuance of farm operations as was ever known. The weather to-day (January 21st) is actually mild, warm, and pleasant: the snow and ice are diminishing amazingly fast, without a drop of rain. The grass lands appear truly benefited by the snow, and the grass has grown underneath its thick coating. The trees and shrubs have received great injury. The evergreens are all *brown*, and the half-matured wood of the last cold summer is dead. Cabbages, coleseed, and all roots much exposed have suffered exceedingly—many already rotten. Swedes now emerging from their thick snow covering look far better than could have been expected, and do not denote any loss in quality. The leaves and bulbs look quite healthy and flourishing. Mangolds, notwithstanding such severe frosts, have kept well in grave, and now are being brought into general requisition, owing to the loss of other food. It is rather too early to commence feeding off mangolds; but there is no help for it, as but little other food remains, and this is a large crop in this district, purposely provided for this emergency. They will do very well, in moderation, in connection with dry cereal food. Our lairage for sheep just now is very bad, and symptoms of inflammatory diseases are prevalent—the lungs being mostly attacked. Some casualties have already occurred, and we look forward with fear. Diuretic or purgative drinks, and occasionally bleeding, should be resorted to; depending, however, much upon the weather and the change of food they are undergoing. Salt should always be accessible to them. The number of fattening sheep or fattening cattle is very limited in this locality; but of pigs we have a good supply, and doing well—their chief food being wheat or barley-meal, as the diseased potatoes this year are so bad as to be unfit for fattening pigs. I regret to say we have much inferior wheat, the meal of which is unfit for human food. The work of the farms in this neighbourhood has progressed tolerably

well during the "blast." Thrashing is very forward: the produce of many wheat stacks have gone to market, and our yards already look very thinly stocked, the yield and weight both unsatisfactory—60lbs. per bushel being seldom realized, and frequently not exceeding 54 lbs. per bushel. Almost every load of manure that could be carted has been removed, either on to the field for ploughing-in, or to the dung-heap for future service. At the present time we are all in perplexity as to what work can now be profitably done—all are awaiting the total exit of "Jack Frost" and his attendants, so that ploughing and wheat-seeding may again be commenced, a very considerable breadth of which we have yet to sow. It is a pleasing feature to be noticed, *i.e.*, that we have had fewer men out of work than usual this winter, chiefly owing to the extra care bestowed upon stock management. The extra work of subsoil draining has not been got on with to any extent, it being impossible to dig. The few following weeks will, I trust, see much of it accomplished, as no department of farm management can be more valuable. It is a gratifying fact, that during the whole of the frost the hollow drains have kept running, and the absence of ice from the ditches into which they empty show the temperature of the soil. This will of itself soon drain the surface soil, and enable ploughing to proceed: at present it is in a perfect pulp, and requires patience ere it be meddled with. This fact alone ought to convince all our slow farmers of the value of subsoil drainage. We are sorry to report that a considerable breadth of the dead level of South Lincolnshire is still undrained.—Jan. 22.

SUFFOLK.

So thoroughly adverse has the year 1860 been in its seasons, influences, and results, to the best interests of agriculture, and to the comfort and success of agriculturists, that but few can regret its departure; and but few, indeed, would desire to re-live its seasons of extreme wet, winds, and cold, and to re-enact the past of unrequited toil upon an ungenial soil, with such antagonistic odds as every element in opposition. We bid adieu to 1860, with a hearty farewell; and though recollections of a hay crop drowned and a harvest deficient clings to us, and the sharper stings of pecuniary difficulties remain as a natural consequence, and act as a more powerful reminder; yet we turn to the future with hope, and hail 1861 as the new year of a new agricultural era, with other prospects and sweeter realities in store. What has 1860 taught us? It has taught us both grave and important lessons, which need to be loudly sounded, and sharply felt, to impress the mind and reach the feelings, for we are dull in our susceptibilities, and slow in our acknowledgments; but the lessons have been truthful and salutary, and we are compelled to feel that, powerful as we are in skill and in judgment, we are powerless to command success; that great as we are in science and in the use of every appliance, a few more clouds, a few degrees less heat, or a few inches more rain, can entirely nullify our best efforts, blight our brightest prospects, and present a scarcity where we gladly anticipated an overflowing plenty. Such is our dependence upon a far mightier Power, that it is our wisdom to know that the increase is not ours, and that the blessing worth having is worth seeking. The recent inclement weather has entirely stopped all out-door work, and much suffering has resulted from the fact that many labourers were thrown out of employment. Field work is in a very backward condition; but the severe frosts have effected much good in counteracting the injurious influences of the past wet year, and even where the land is unploughed, the frost has sufficiently penetrated to disintegrate the soil, and improve its condition for a future crop. Turnips have been so frozen, that sheep have made but little progress, and the losses have been very great. Within the past few months not less than 15 per cent. of the lambs lambled in 1860 have died of disease, and from Cambridgeshire, Berkshire, and other counties, we receive similar complaints. Mutton must be very high in price in the Spring and Summer, and with the partial loss of the hay and root crops, beef must also be dear in value; this country will manufacture many thousands less stones of meat this year than usual. The septennial average is arranged to govern the rent-charge

payment acts with the greatest truthfulness when taken upon the general average of 25 years; but it would be more to the interest both of payer and receiver, that whilst equally faithful, its action should be more immediate, and the payment of the year in proportion to the price of corn at the time. Such an arrangement would be more to the convenience of the tithe owner and tenant. The Anti-Hop Duty Association is very ably preparing and paying the way for the Anti-Malt-tax Association, and with the cessation of the Chinese war, the general peace of England with the world, the diminution of Government expenditure, and the revelations of Dr. Letheby upon the English public, not only paying the malt-duty, but being poisoned for their pains, defrauded in their revenue, and crippled in their agriculture by its operations in addition, makes the present moment most opportune for a combined movement; and men not only in Suffolk, but in every county, are preparing for a combination into one powerful society, which has the promise of influential support in high quarters, and the hearty co-operation of the masses, to carry forward the cause with vigour and undaunted perseverance.—Jan. 25.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

AYLESBURY JANUARY FAIR, (Friday last).—At this fair there was a large supply of cattle and horses; but very few sheep were on offer. There being a good attendance of buyers, trade in all kinds ruled brisk, and very little of any kind was left over. The horses on offer were not of the first-rate kind usually seen at this fair; but many good, serviceable ones were sold, some making as high a price as £40 each; and, the demand being good, very few remained unsold. For cow stock there was a very good sale, and a good clearance was effected at the following prices: Milch cows £12 to £21, barreners £8 to £15, stirks and steers £4 to £8 each. There was also a good show of fat beasts, which met with ready sale at from 4s. to 4s. 6d. per stone. There was but a small supply of sheep, but all met with purchasers at rather advanced prices. Altogether, the fair, as regarded business transactions, was the most active that has been held here for some time.

BANBURY FAIR.—Both in the beast and sheep markets there was an average supply of stock, including a fair proportion of good beef and mutton. Trade, especially for the latter qualities, was brisk, and prices accordingly. Good beef fetched from 3s. 8d. to 4s. 4d., and good mutton from 4s. to 5s. per 8lbs. Our annual fair for horses has been held, and a moderate business has been done. The principal demand was for the better class of horses, nags varying from £30 to £100, and cart horses from £50 to £80. There were several dealers from London and the north, one from Manchester purchasing no less than forty good cart-horses. Inferior animals were very dull of sale.

BANWELL FAIR.—There was a tolerably good show of fat beasts, the primest of which found ready purchasers at prices varying from 65s. to 70s. per cwt. Middling qualities ruled lower, but a clearance was effected. Good grazers sold well, considering the scarcity of grass and the high price of hay. Cows and calves brought from £11 to £14.

DUMFRIES PORK MARKET.—The market was inferior to last week in all respects. The number of carcasses was 410. There was not such a large attendance of buyers, and the demand consequently was not so brisk. Prices are a shade lower, namely, current rates for prime carcasses 7s. 2d. to 7s. 3d., and in a number of instances 7s. 4d. per imperial stone. Secondary, 7s. to 7s. 1d.; and heavy and coarse 6s. 6d. upwards.

LLANFAIR "BIG MARKET."—The supply of pigs was large, and sold at an advance upon the recent quotations: there were a good many fat ones which sold at 5½d. and 6d. per lb. The market was scantily supplied with sheep, and the mutton trade was active at full prices. The show of cattle was small, and very inferior.

NEWTON-STEWART PORK MARKET.—Owing to the change of weather, which is not now so favourable for curing, prices had a downward tendency, although a few prime carcasses realized last week's quotations.

READING FAT PIG TRADE.—The supply of porkers

has much increased since last week, and prices are consequently depressed, business being generally transacted at 11s. 6d. to 11s. 9d. per score. Hogs are not so plentiful, and the top price is quoted at 12s.

WORCESTER FAIR.—There was a large attendance of buyers, and a brisk business done in beef and mutton, of which there was a good supply, at an advanced price. Beef fetched 6½d. to 7d. per lb.; mutton 7½d. to 8d. A good many fat pigs were offered for sale, and realized 11s. per score. Store cattle were a drug.

IRISH FAIRS.—**BALLYBAY:** The show of milch cattle was very large, but holders were hard to deal with, dairy produce being unusually high; prime cows went at 11l. to 14l., in a few instances 14l. 10s. were given; springers of good breed, and in forward condition, were eagerly bought up at an average of 1l 9s.; inferior and aged cows may be quoted at 5l. to 7l. The transactions in the three classes were extensive, few animals remaining unsold at the close of the day. Young cattle were abundant, but the business was dull. There was very little inquiry for two-year-old bullocks, and the value is without change, the current rates being from 4l. to 6l., two-year-old heifers were worth a trifle more, but sales were limited; yearlings were scarcely inquired for at all. The supply of beef cattle was large, and dealers bought free on English account; victuallers purchased spiritedly, the terms varying from 57s. to 65s. per cwt.; coarse beasts met buyers at 14l. to 17l., according to weight and condition, inferior beasts may be quoted at 45s. per cwt. Sheep were abundant, and victuallers were needy, so that former rates were well maintained; prime wethers sold freely at 50s. to 60s. each; fat ewes went at 35s. to 45s. The pig market was very large, and the demand being active, a heavy business was done; bacon pigs sold at 60s. per cwt. as the extreme figures; the current rates for pork were 55s. to 58s. 6d. per cwt.; store pigs went at 3l. upwards; slips 25s. to 30s. each; suckers were not asked for. There was a large show of horses, but the trade was almost exclusively limited to dealers; serviceable farm-horses changed owners at 20l. to 25l.; saddle or harness horses were worth from 35l. to 45l. There were not many transactions in higher-priced animals. **GORSERIDGE:** The supply of stock was exceedingly meagre, and quite unequal to the demand. Beef rated at from 60s. to 70s. per cwt.; mutton from 6d. to 7½d. per lb.; two-and-a-half year old heifers and bullocks sold at from £8 to £10 a head; lambs, of which there was a fair supply, brought from 23s. to 33s. each. **KELLS (County Meath):** Beef of every kind maintained the late heavy rates, going from 50s. to 65s. in the range. The swine fair was well supplied with heavy bacon pigs. The primest bacon quotes at 54s. to 55s. per cwt.; store pigs only slowly bought, from 30s. to 50s. each; suckers and creepers from 16s. to 30s. per pair. The sheep fair was moderate. Mutton maintained last week's rates fully, and the demand was good. **ATHLONE:** Holders were very difficult to deal with; money was very abundant, and freely offered, but until an advanced hour sales went languidly. Prime beef reached 56s. to 59s. per cwt., about 6½d. per lb., inferior 5d. to 5½d.; prime pork 5d. to 5½d., inferior hardly 5d. Store cattle sold pretty well—three-year-old bullocks from £9 to £12 10s.; two-year ditto, from £6 to £7 17s.; heifers a shade higher; younger stock hardly saleable. Springer and dairy cows were in good supply, and brought high figures—£10 to £16 were the general prices. Some very fine bacon hogs reached £6 10s. to £8 each; store pigs were rather depressed in value; so also were store sheep. Horses were numerous; buying for the army was very extensive; some prime weight carriers, reached £100 to £160 each.

COUNTRY POTATO MARKETS.—**YORK, January 19:** Potatoes 12d. per peck, and 3s. 8d. to 4s. per bushel.—**KNARESBRO', Jan. 23:** Potatoes, 1s. 3d. to 1s. 4d. per 21 lbs.—**PICKERING, Jan. 21:** Potatoes are scarce, but prices are unaltered. White roughs 4s. to 4s. 6d., flukes 4s. 6d. to 5s. per 5 stones.—**SELBY, Jan. 21:** Potatoes, 8½d. to 9d. per stone.—**LEEDS, Jan. 22:** Potatoes, 1s. to 1s. 2d. wholesale, and 1s. 2d. to 1s. 4d. retail per 21lbs.—**RICHMOND, Jan. 19:** Potatoes, 1s. per peck.—**SHEFFIELD, Jan. 22:** Potatoes sell at from 7s. 6d. to 16s. per 18 stones.—**MANCHESTER, Jan. 22:** Potatoes 9s. to 14s. per 252lbs.

GLASGOW.—Few Cheese coming forward, and scarcely any inquiry for them. Prices as formerly. Early made 59s. to 63s., late and secondary 52s. to 58s., skim milk 27s. to 29s. per cwt.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The commencement of the month brought a renewal of frost, which continued with severity for three weeks. During this time scarcely anything could be done except carting manure and thrashing. It was fair to expect that this fine opportunity would greatly improve the condition of the wheat and raise its value. There was indeed some improvement early in the month, and larger deliveries took place; but the return of mild and humid weather more than counterbalanced the beneficial effects of the frost, and much that has come to market has been unsaleable. Such a state of things following upon the previous stagnation in business, occasioned partly by the severe weather and partly by the high rate of interest, naturally produced some decline in prices. Even the best new, being but indifferent, has given way 2s. to 3s. per qr., and secondary foreign has declined 1s. to 2s. per qr. The general averages, however, being about a fortnight behind the real business done, show an improvement from 54s. to 57s. 3d., farmers having doubtless found it useless to send any but their best samples to market, though even these fell short of millers' requirements. A large fleet expected from the Mediterranean, with perhaps four hundred cargoes of wheat, has kept millers upon the reserve, but the first instalment has made as yet little change. The depression may last, however, for some little time; but as America and the Baltic are still closed, and dry wheat in very large quantities must be wanted, we expect an improvement in March if not earlier. Beyond the necessities of a largely-increased consumption, the political horizon, both in the old and new world, is so beclouded that peace is threatened, and though England should keep from the embroilment, the value of corn is very likely to increase, and with only half the land sown with wheat, and the rest mostly sodden and foul, without a fine and dry spring the prospect of a good harvest is distant. Should the weather again be rough therefore, a smart reaction is highly probable, as we can by no means be certain of a second year of plenty in America, and the outbreak of war there might stop the yet-remaining half of our expected supplies. A war between Denmark and Prussia would be equally threatening in the Baltic. Italy, already in want, may also intercept supplies from the Black Sea and Egypt, and then if thrown upon our own poor crop we should find out our real situation. Let us, however, hope for the best—that the season already changed may be permanently fine, and that the “dogs of war,” instead of being let slip by the demon of mischief, will be held in check by means of a pacific and masterly diplomacy.

The following shows the prices quoted in several corn-producing countries, but the time of year has everywhere made business limited and rates almost nominal. The best wheat at Paris was quoted

57s. 6d., and at Bordeaux 59s. 6d. The duty being raised at Nantes by the sliding scale, no shipments were making there. The price at Louvain was 60s. In Holland the rates were above our own, viz., 73s. to 74s., for the best high-mixed Danzig, though for inferior native only 48s. was quoted. Fine red at Hambro' was quoted 58s. to 60s. 6d. Cologne prices were 54s. to 55s. per qr. Prices at Odessa were about 40s. to 48s. Soft inferior wheat at Galatz 33s. 6d.; at Constantinople 38s. 6d. In Spain, the northern and southern markets greatly varied: Santander, the only eligible shipping port, quoted 59s. 6d. The quotation at Seville was about 66s. Soft wheat was scarce at Algiers, and quoted 58s. 6d. per qr. Fall wheat at Hamilton in Canada 37s. 6d. per 480lbs.; red States at New York 45s. 8d.; white Michigan 47s. 4d., prime to 53s. 4d. per 480lbs.; Chicago spring 39s. 8d. The quantity on hand available for export was considered to be about 300,000 qrs., with 580,000 barrels flour. The stock in London may be about 500,000 qrs. wheat, 170,000 barrels flour.

The imports into the kingdom last year were 5,906,175 qrs. wheat, and 5,139,248 cwts. flour, the greater portion being during the last four months. In London alone the increase of the last quarter over that of 1859 was equal to 348,433 qrs. wheat.

The first Monday in Mark-Lane opened on the back of short supplies of wheat both English and foreign. There were very few additional samples from Essex and Kent during the morning, but the return of severe frost having again interrupted navigation, business was limited to needy buyers, who had to pay full prices for the few good parcels of English that were accessible. Foreign also was less in demand from the absence of country buyers, but prices were firm for everything in granary. The condition of the samples shown this week in the country was improved, but the quantity being larger trade generally was inactive, though some places, as Sheffield, Worksop, and Market-Rasen, were rather higher. The stoppage of trade influenced the first Liverpool market to a decline of 1d. to 2d. per cental, and on Friday the fall was still increased, being another 2d. per 100lbs. In Ireland and Scotland there was dullness without change.

The second market was shortly supplied with foreign and home-grown samples. The morning's display from the near countries was also limited, but business being equally so, no change took place in the rates of either English or foreign samples. The report of dullness in town this week, and the better supplies in the country, brought a rather lower range of prices. Stockton-on-Tees, Spalding, and Gloucester were 1s. to 2s. per qr. cheaper, and Hull gave way 1s. per qr. for second

qualities, from the greater abundance. Liverpool, on Tuesday, was not cheaper, and though business at the last market was quiet, there was no further reduction.

The third Monday showed very little increase on the former small supplies in London. But there being a better provision from Essex and Kent, and the thaw having sadly deteriorated the condition, there was a very dull market even for the best new wheat at 2s. per qr. less money, the bulk being unsold, and unfit for use without drying and a plentiful admixture with foreign. Fine foreign found rather more enquiry, but Russian and the lower kinds were quite 1s. per qr. cheaper.

On the fourth and last Monday there was a large foreign supply, the river having been navigable, though not much English. The show from Kent and Essex was not large; but among it were many of the old damp samples of the previous week, and the weather keeping the condition of the fresh supply in a damp state, there was a further depression on new samples, say of 1s. to 2s. per qr. for the best then on hand; but there was so little really good, that the value of dry old was not affected. English factors again found themselves in the predicament of being unable to effect sales of the bulk on their stands. The foreign trade in the finest Danzig sorts was but slow, but holders did not give way, as such qualities could not be replaced; but French, American, and Russian sorts were 1s. to 2s. per qr. lower, with but little doing.

The imports for the four weeks into London were 12,285 qrs. English, and 66,590 qrs. foreign, against 29,386 qrs. English and 13,629 qrs. foreign in 1860. The exports were 2,170 qrs. wheat and 338 cwt. flour.

The flour trade, which commenced somewhat buoyantly with 43s. per sack as the price of Norfolk, upon the change to damp weather found an almost stagnation—the thaw on the third Monday causing a decline of 2s., and on the last of 1s. per sack more. American, however, notwithstanding heavy supplies, have been so much in favour, from their generally good quality and fitness for keeping, that rates have not declined more than about 1s. per brl.—good flour being yet held at 31s. to 32s. per brl. and double extra in small lots to 34s. Town millers have all along maintained the price of the best flour; neither raising it when country sorts were held for more, nor giving way during a decline—being under a necessity to pay high prices for the best foreign wheat, to keep up the quality; 57s. per sack has been therefore the top price all through the month. The imports into London for the four weeks were 59,387 sacks English and 5,747 sacks 82,646 brls. foreign, against 72,534 sacks country and 600 sacks 7,007 brls. foreign in 1860.

Of British barley, the supplies have gradually increased, though still but small. Of foreign they have been quite short; but, the prices of all sorts having ruled high, the tendency generally has been downwards, even for the best malting, while samples below this have fallen fully 2s. per qr., with very great difficulty in sales. The scarcity, however, of stocks in foreign grinding have kept

the rates of such without variation, though the demand has been limited. Till heavy supplies come in from the Black Sea, we contemplate little reduction in grinding sorts, as there must be a large demand for pig food, from the great losses in cattle; but malting and the higher sorts we expect will range lower, after the seed demand is over. The imports for the four weeks into London were 23,165 qrs. British and 12,249 qrs. foreign, against 35,145 qrs. British and 53,365 qrs. foreign in 1860. The total imports in 1860 were 2,122,016 qrs.

The malt trade has ruled very heavy through the month, and closed 2s. per qr. cheaper. It is said the extensive use of sugar in brewing, as well as the distress among the poor, has injured this branch of business.

The oat trade has been a perfect enigma. From the insignificant supplies of foreign, and limited arrivals from Scotland and Ireland, it was thought prices must have been forced up; but with literally nothing foreign up on the fourth Monday, prices were unchanged, and trade thoroughly dull. The inference is, therefore, that dealers have been content to rest upon their own stocks, in the expectation that good arrivals would shortly give them the opportunity to replace to advantage. Whence these supplies are to come while the Baltic is closed, it is difficult to divine, and those from Odessa are only expected to be small; we should not, therefore, be surprised to have to report an improvement on the first fair arrivals, and the only check upon the prospect are the high rates at present paying, and the bad state of the hay crop presents us with nothing to fall back upon for horse feed. The imports during the four weeks in January were 25,102 qrs. English, 1,717 qrs. Scotch, 5,916 qrs. Irish, and 20,665 qrs. foreign: against 15,968 qrs. English, 5,504 qrs. Scotch, 5,710 qrs. Irish, 71,064 qrs. foreign in 1860. The total imports then were 2,308,280 qrs. The present stocks in London may be about 150,000 qrs.

Beans gave gay on the third Monday about 1s. per qr. for new English, but there has been little difference in the value of fine old or foreign sorts, supplies from Egypt having fallen off. The imports for the four weeks were 4,456 qrs. English, 4,659 qrs. foreign: against 4,931 qrs. English, 5,828 qrs. foreign in 1860. The imports last year were 440,860 qrs. Stocks in London granaries scarcely over 1,000 qrs.

Peas as well as beans have been steady through the month. The frost not creating much demand for boilers, which had arrived more plentifully from abroad, its departure caused no decline, as stocks are only about 8,500 qrs. in London, so that a Government contract would soon clear the best samples. Maples will doubtless remain dear, from the seed demand, and little change can be expected in other sorts. The imports for four weeks were 2,453 qrs. English, 8,564 qrs. foreign, against 3,216 qrs. English, 720 qrs. foreign in 1860. The total imports for 1860 were 317,545 qrs. Linseed has been in good supply during the month, but maintained its value all through, the demand for cattle feed being considerable, nor does there seem much prospect of lower prices.

The seed trade, though many enquirers have appeared, has not yet commenced, the reported entire failure of the English crop not yet giving courage to dealers to get into stock. But holders, knowing how things are, have been firm, and there seems every prospect of red seed being dearer, as France promises but small imports. Spring tares are beginning to get into demand, and full rates have been asked, say 64s. to 66s. for Baltic small. Canary is quite neglected, though offered low, the quality being poor. Other seeds much as last quoted.

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Dec. 15, 1860	51 5	38 7	22 1	33 6	45 6	43 8
Dec. 22, 1860	52 6	38 6	21 8	35 2	45 2	43 10
Dec. 29, 1860	51 0	39 7	22 6	34 7	44 10	45 7
Jan. 5, 1861	56 3	40 3	22 6	39 10	43 4	42 0
Jan. 12, 1861	57 1	40 6	22 6	34 6	43 10	44 6
Jan. 19, 1861	57 3	40 6	23 2	34 9	41 10	43 0
Aggregate Average	54 9	39 8	22 5	35 5	44 1	43 11
Same time last year	43 11	34 8	21 4	32 0	39 5	37 6

PRICES OF SEEDS.

BRITISH SEEDS.

MUSTARDSEED, per bush, brown.....	11s. to 15s.
CORIANDER, per cwt.....	14s. 16s.
CANARY, per qr.....	50s. 48s.
TREFOIL.....	24s. 30s.
TARES, winter, new, per bushel.....	10s. —s.
LINSEED, per qr., sowing —s. to 74s. crushing..	58s. to 60s.
LINSEED CAKES, per ton.....	£9 10s. to £10 10s.
RAPESEED, per qr.....	70s. to 76s.
RAPE CAKE, per ton.....	£5 10s. to £6 0s.

FOREIGN SEEDS, &c.

CLOVERSEED, red 46s. to 64s. white 72s. to 90s.	
TREFOIL.....	18s. 28s.
HEMPSEED, small, —s. per qr.....	Dutch —s. 48s.
CORIANDER, per cwt.....	16s. 18s.
CARAWAY.....	32s. —s.
LINSEED, per qr., Baltic 50s. to 52s....Bombay 52s. 56s.	
LINSEED CAKE, per ton.....	£9 10s. to £11 0s.
RAPESEED, Dutch.....	—s. to —s.
RAPE CAKE, per ton.....	£5 0s. to £6 0s.

HOP MARKET.

BOROUGH, LONDON, Jan. 23.—We continue to experience a steady trade for yearlings and good samples of earlier date, but for the new growth the demand is very limited.

Mid and East Kents.....	100s., 160s., 240s.
Weald of Kents.....	60s., 140s., 200s.
Sussex.....	60s., 120s., 160s.
Yearlings.....	100s., 147s., 190s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, Jan. 28.—During the past week the arrivals, both coastwise and by rail, have been numerous, in consequence of which prices have undergone a further reduction. The following are this day's quotations:

Yorkshire Flukes.....	155s. to 165s. per ton.
Lincolnshire Regents.....	115s. to 120s. "
Dunbar red soil do.....	160s. to 170s. "
North Berwick do.....	120s. to 130s. "
Perth, Forfar, and Fife do.....	110s. to 120s. "
Ditto, do. do. Reds and Rocks..	105s. to 115s. "
French Whites.....	90s. to 100s. "
Belgian do.....	85s. to 90s. "
Dutch do.....	80s. to 85s. "

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.—	s.	d.	CHEESE, per cwt.—	s.	d.
Friesland.....	108	112	Cheeshire.....	new 72 to 84	
Jersey.....	106	112	Cheddar.....	74	86
Dorset.....	100	114	Double Gloucester.....	68	74
Carlisle.....	100	114	HAMS.....	—	—
Waterford.....	100	114	York.....	78	82
Cork.....	100	112	Cumberland.....	78	82
Limerick.....	98	100	Irish.....	76	84
Sligo.....	100	114	BACON: Wiltshire, dried.....	68	72
FRESH, per doz. 14s. 6d. to 17s. 0d.			Irish, green.....	62	66

WOOL MARKETS.

ENGLISH WOOL MARKET.

LONDON, MONDAY, Jan. 23.—Notwithstanding that the supply of English Wool on offer is very limited, and that the stocks in the hands of the manufacturers are trifling, we have again to report considerable heaviness in the demand for all kinds, owing to the high range in the value of money in the discount market, at barely stationary prices. Until money becomes cheaper we can hardly anticipate any improvement in the wool trade.

Persack of 240lbs.

Fleeces—Southdown Hogs.....	£19 0	to £19 10
Do. Half-bred Hogs.....	20 0	20 10
Do. Kent.....	19 0	19 10
Do. Southdown Ewes & Wethers	17 10	18 0
Do. Leicester do.....	17 10	18 0
Sorts—Clothing, picklock.....	20 0	20 10
Do. Prime and picklock.....	18 10	19 0
Do. Choice.....	17 0	18 0
Do. Super.....	15 0	16 0
Do. Combing—Wether matching..	20 0	21 0
Do. Picklock.....	18 0	18 10
Do. Common.....	16 0	16 10
Do. Hog-matching.....	23 10	24 0
Do. Picklock matchig.....	18 10	19 10
Do. Super do.....	16 0	16 10

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS,

Jan. 25.—There is no improvement in demand, and yet prices are not materially lower for English combing wool. Short wool is in fair demand. In colonial wool there is a moderate trade. The state of the American market has checked many branches of trade, which otherwise would have been busy.

LIVERPOOL WOOL MARKET, JAN. 26.

SCOTCH.—There is a fair demand for good Laid Highland at fully late rates, while inferior is still neglected. White Highland is scarce, and enquired for. Cheviots are not so much enquired for: the high relative value checks consumption.

	s. d.	s. d.
Laid Highland Wool per 24lbs.	11 6	to 13 0
White Highland do.....	13 9	17 0
Laid Crossed do.....unwashed....	14 6	16 6
Do. do.....washed.....	16 0	18 6
Laid Cheviot do.....unwashed....	18 0	22 0
Do. do.....washed.....	22 0	28 0
White Cheviot do.....washed....	34 0	42 0

FOREIGN AND COLONIAL WOOL MARKET.

	Per lb.	s. d.	s. d.
German, { 1st and 2nd Elect.....	3 4	to 4 6	
Saxon, { Prima.....	2 4	3 0	
and { Secunda.....	2 0	2 4	
Prussian, { Tertia.....	1 8	1 10	
COLONIAL:—SYDNEY—Lambs.....	1 3 1/2	2 3 1/2	
Scoured do.....	1 5 1/2	3 2 1/2	
Unwashed.....	0 10 1/2	1 2	
Locks and Pieces.....	0 10 1/2	1 9	
Slips and Skin.....	1 0 1/2	1 9 1/2	
PORT PHILIP—Lambs.....	1 3	2 8	
Scoured do.....	1 3	3 3	
Unwashed.....	0 10	1 4	
Locks and Pieces.....	0 7 1/2	1 10 1/2	
S. AUSTRALIAN—Lambs.....	1 7 1/2	2 1	
Scoured do.....	1 4	2 6 1/2	
Unwashed.....	0 9 1/2	1 2 1/2	
Locks and Pieces.....	1 1 1/2	0 0	
V. D. LAND—Lambs.....	1 1 1/2	2 3	
Scoured do.....	1 1 1/2	1 10 1/2	
Unwashed.....	1 0	1 7	
Locks and Pieces.....	1 1	1 8 1/2	
CAPE OF GOOD HOPE—Fleeces.....	0 8 1/2	2 0 1/2	
Lambs.....	0 11 1/2	2 1	
Scoured.....	1 0 1/2	2 2	
Unwashed.....	0 8	1 6	

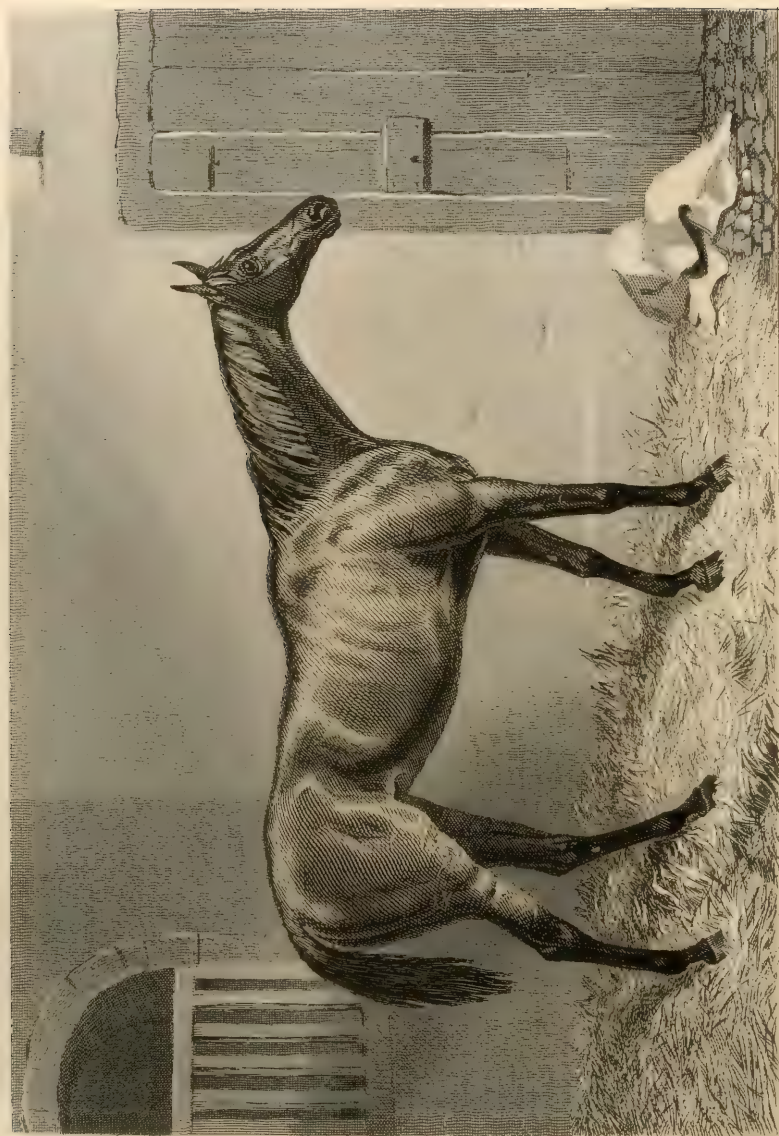
MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from importers' stores, £12 5s. to £12 12s. p. ton. Bones, 25 to 25 10s. per ton; ditto crushed, 45s. do; ditto dissolved, 25 10s. do; ditto half-inch 19s. to 19s. 6d. per qr.; ditto dust, 19s. to 20s.

Animal Charcoal, (70 per cent. phosphate) £4 10s. to £5 per ton. Coprolite, Cambridge, in London, whole 42s. to 44s., ground 54s. to 58s. 1 Suffolk, whole 35s., ground 46s. to 47s. per ton. Nitrate of Soda, £13 10s. to £14 10s. Gypsum, 30s. per ton. Sulphate of Ammonia, £14 10s. to £15 per ton. Sulphuric Acid, concentrated 1-845 lb. per lb., brown 1-712 03d. Superphosphate of Lime, 25 10s. to 26 6s. per ton. Blood Manure, 25 5s. to 27 10s. per ton. Linseed Cakes, best American, £11 7s. 6d. to £12 5s. (brl.), ditto £11 10s. to £12 (bag), English £11 5s. to £12 per ton. Rape Cake, 26 15s. to 27. Cottonseed Cake, 27 to 27 10s. per ton.





THE FARMER'S MAGAZINE.

MARCH, 1861.

PLATE I.

A KERRY BULL,

RECENTLY EXPORTED TO THE CAPE OF GOOD HOPE.

This bull was exported immediately after the Dublin Spring Show of last year (where he was highly commended), by Captain Bayley, who is, we believe, himself a breeder of Kerry cattle: while his cousin at the Cape, farms and breeds extensively from English stock. So far, however, Mr. Bayley has been more directly engaged in improving the native horses—an important branch of a Cape farmer's business; and he has had out amongst others, Evenus, a thorough-bred stallion of some repute, once the property of Lord Stradbroke, and a winner of the Cambridgeshire; Tally-ho! Farmer's Son, and twenty or thirty other good stallions.

In Ireland, the Kerrys are coming to be regarded as rather "fancy" stock, from which point of view they are much to be commended. They are very handsome, or rather pretty, are well shaped, and the cows have good bags with rich milk, especially

adaptable for butter making. We fear, though, the breed is not kept up with much care, as the show of them of late years has been very unequal—a few good-looking animals like the bull in the plate, with often a very ragged lot behind the prize winners. But a Kerry has the repute of being able to "live on anything," an excellence occasionally put to the test; and at Cork, last summer, we were assured some of them were getting fat on the week's better rations they got in the show week. With a little more size, the Kerry, both for quality and dairy purposes, has still his uses, and perhaps at the Cape Mr. Bayley may be able to grow him, or cross him into something a little bigger.

This bull was bred by Mr. Ralph Cusack, and Captain Bayley sent out with him a yearling from his own herd. They were shipped as usual by Mr. Weekes, of Pimlico; and it was on their way through that Mr. Corbet got his "sitting."

PLATE II.

BUTTERFLY; A THOROUGH-BRED FILLY.

THE PROPERTY OF MESSRS. EASTWOOD AND CULSHAW.

Butterfly, bred by Mr. W. Sharpe in 1856, is by Turnus, out of Catherine, by Don John, her dam Arachne, by Filho da Puta.

Turnus, bred by Count Hahn in Germany in 1846, is by Taurus, out of Clarissa, by Defence. He, however, distinguished himself as a race-horse in this country, especially at Goodwood as a four-year-old, when he won both the Stewards' and the Chesterfield Cups against large fields. He was not allowed to return to the Continent, but was purchased by Mr. Sharpe, and stood at Knockhill in 1853. He continued to cover there for some seasons, but for the last two or three was at Wink-

field in Berkshire; and is now at Castle Hill Farm, near Egham. Turnus' stock came out in 1856, and he is the sire of Bonnie Doon, Gitana, Hamlet, Knockburn, Maggie Lauder, Mauchline, Potboy, Trip-the-Daisy, Captain Wedderburn, Ochiltree, and Butterfly. Of these, Hamlet, and Captain Wedderburn and Trip-the-Daisy (an own brother and sister to Butterfly), have been pretty fair performers; but there is nothing amongst them to rank with the Oaks winner herself.

Catherine, bred by Lord Chesterfield in 1844, was nothing but a plater, and his Lordship soon found out all she was worth in this way. She went

to the stud as Mr. Sharpe's, and threw Parnassus, by Paragone, in 1852, and was barren in 1853. Since then all her produce has been to Turnus, and these, as we have just said, include Trip-the-Daisy, foaled in 1854, Captain Wedderburn in 1855, and Butterfly in 1857.

Butterfly is a chesnut filly standing fifteen hands three inches high. She has a good but not handsome head, and though altogether a fine mare, was not quite so "pretty" as some of her opponents for the Oaks. She has some wonderfully good points, and amongst these a famous forehead, with great depth of girth, and powerful quarters. She has capital arms and thighs, with good sound legs, and a very lasting look about her.

Mr. Sharpe, or "Willie Sharpe," as he is known over the Border, is honorary secretary of the Royal Caledonian Hunt Club, and one of the staunchest supporters both of the Leash and the Turf in Scotland. He sold the chesnut Catherine filly in the first instance to Oates the trainer of Middleham,

who in turn offered her to Mr. Eastwood, one of his masters, and the agent to Colonel Towneley. She ultimately became the joint property of Mr. Eastwood and Mr. Culshaw, the latter of whom has long had the management of the Colonel's famous herd of shorthorn cattle; and Culshaw insisted as part of the bargain that the filly should be called "Butterfly," in compliment to that renowned tribe of bovine worthies. There are too many Butterflies, however, already in the Stud Book to justify the title, although in the Herd Book there is every precedent for Butterflies, Duchesses, and Matchless without end.

There has been no little discussion as to whether Butterfly, in her preparation last year, had the use of the Turkish bath; and contradictions and cross-contradictions followed with the most pertinacious exactness. We have the authority of one of her owners for saying that the mare was never subjected to such a bath in her life.

A DROP OF RAIN-WATER.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

In a previous number of this valuable Magazine (*ante*, page 98) we have traced the origin of the aqueous vapour of our atmosphere. That vapour, the mother of the rain-drop, we followed in its course as it rose into the atmosphere from the surface of the earth, its waters, and its tenants, both vegetable and animal. The beneficial influence of that evaporation we can partially perceive in the cooling effects which it produces; but there are other and highly important results arising from this insensible emission of steam, with which we are as yet only imperfectly acquainted. If the insensible moisture which thus exists was withdrawn from the air, all vegetation, all animals would either languish or perish. We know how our plants and ourselves suffer in a dry easterly wind, and that the far drier winds, such as those which flow from the burning deserts of Africa and other places, although not utterly devoid of moisture, are almost insupportable by animal life. But if when it is insensible its services to us are so essential, to an equally important extent is the moisture of the atmosphere indispensable to us when it becomes visible in clouds, and again descends upon us in the dew and in the rain-drop. It is needless to refer to these as essential to our existence, for they are the only sources whence are derived the water on which the vegetable and animal worlds subsist. Every cultivator of our country is deeply interested in these marvellous movements. To avail himself to the greater extent of the atmospheric vapours, is one very material reason why he pulverizes and deepens his soils; for the better this is accomplished, the more freely the air penetrates into the ground, and the more copious is the deposition in the soil of its moisture; an aqueous portion which, by the contrivance of its Divine Author, is present in the largest proportions

in the atmosphere in the summer season, when the weather is the warmest, and the need of moisture the greatest. This deposition of water, too, we must not forget, is frequently taking place, especially in permeable soils, when the evaporation from the surface of the soil is still proceeding. Many a skilful grower of roots avails himself of this state of affairs, without being aware of the true reasons of his mode of cultivation. The sun may keep shining, the rain-cloud be long absent, but still he keeps his horse-hoe at work between his rows of turnips, for he has discovered that the more the soil is disturbed, the more freely the atmosphere enters the soil, and then the better the swedes and mangolds prosper.

But let us proceed to follow the watery vapour of our atmosphere from its invisible state, to the time when it becomes evident to our senses: in the atmosphere still suspended, as clouds and fogs, or descended on the earth, fluid, as dew and rain, or solidified in hail or snow.

The aqueous vapour which we have traced from the surface of the earth, its waters, plants, and animals, mixes at first entirely with the atmospheric gases. But in the eternal circles which it is ever pursuing, it soon again becomes visible to our senses; it appears as the cloud, or collection of visible vapour or steam, which floats over our heads at varying, yet considerable elevations. Why, however, that transition from invisible vapour to cloud takes place, is not yet well determined. We must suppose that the air in which the cloud floats is saturated with moisture—cannot dissolve any of the cloud: but why the insensible vapour takes the form of steam or cloud, rather than that of drops of rain, is not quite clear. It is very true, that a cubic foot of air at a temperature of 66°, can hold nearly 8 grains of water, and that when its tem-

perature is reduced to 45° , it can then only retain between three or four grains; but then a warm stratum of air can only, as far as we see, be cooled by admixture with a current of air of a lower temperature, and if so, then what the one loses in temperature, and in dissolving power, the cooler current would seem to gain. Dr. Hutton was the first to throw light upon this difficult enquiry. He traced the result of mixing two currents of air at different temperatures, and reasoned upon the fact that the quantity of moisture which air can hold increases in a much faster ratio than its temperature. He supposed the case of equal bulks of air, in a state of saturation, and at the different temperatures of 15 and 45 centesimal degrees, and that these were intermixed, the mixture will evidently have the mean temperature of 30° . But since at these temperatures, the one portion held 200 parts of humidity, and the other 800, the aggregate must contain 1000 parts, or either half of it 500; at the mean or resulting temperature, however, this portion could only retain 400 parts of water, and consequently the difference, or 100 parts, amounting to the 200th part of the whole weight of air, must be precipitated. Thus separating, it must apparently appear to us as steam floating in air saturated with moisture, or it must descend in rain.

The explanation is not, however, unattended with difficulties; and the origin of rain has been hitherto so little understood, that, as usual with us in our want of knowledge, we have recourse to other mysteries, and employing these, call them *explanations* of the one immediately engaging our attention. Thus we suppose that electricity operates upon the clouds, and then the electrified clouds upon each other: hence producing rain, lightning, and thunder. That clouds are formed, besides, of water *heavier* than the atmosphere in which they float, is well known. The reason of the *lighter* body supporting the *heavier* does not at first appear so clearly. Von Kaemtz, in his work on meteorology, however, is of opinion that a cloud is not a motionless mass, but that, on the contrary, it is in continual motion; when its vesicles, as they are carried along by the wind, arrive in a dry air, they dissolve, whilst on the side of the wind the vapour is precipitated in the vesicular state. Thus a cloud apparently motionless, often slowly descends, and its lower part is continually dissolved, while the upper portion increases by the addition of new vesicles. There exists a force directly opposed to the fall of clouds in that of ascending currents of air. On this account it is, that the *cumuli* are more elevated at mid-day than the morning; since the currents of air become lighter as they become warmer. Towards evening, on the contrary, as soon as this current becomes weaker, the clouds actually descend, and dissolve when they arrive at the lower and warmer regions of the atmosphere. The horizontal currents also oppose the fall of clouds. There are other bodies, besides the cloud vesicles, which are continually supported by currents of air: the fine particles of the dust of our rooms, rendered visible to us in a sunbeam; the clouds of fine soot dust falling twenty miles from London; the impalpable dust of the desert, or of volcanic eruptions falling on vessels at sea; all indicate the same thing.

Let us not, then, observes Kaemtz, seek to explain the suspension of clouds by extraordinary causes: it is as easy of comprehension as that of dust.

Fogs hardly differ from the clouds in composition. When the aqueous vapour separates from the atmosphere, and becomes visible at considerable heights from the earth, we call it cloud. When the same separated vapour rests on the earth, we call it fog. A traveller sees the clouds hanging half way up the mountain side: he tells you that the summit is hidden by the cloud from his sight; when he has ascended that mountain, the same mist hides the earth from his sight; or, as he says, there is a fog beneath him. These fogs, are, from their vicinity to the earth, probably more impure than the clouds; they mix with the smoke of our fires and the emanations of animal life. The amount of some of the impurities in fog water naturally increases as the population of the district in which it is collected becomes more dense. For instance, in a gallon of water of a fog, there has been detected—

At Liebfraunberg, in Germany.....	0.1790
At Paris.....	9.600
In the same amount of dew water at	0.0714
Liebfraunberg	to
	0.4340
In rain water at Paris	0.2100
„ „ Liebfraunberg.....	0.0350

The ammonia of the fog—as well as another soluble matter—nitric acid, found occasionally in it, are both in a state of solution in the vapour; other matters are frequently detected, that are merely mechanically suspended among its vesicles. “Seamen,” says Maury (266), “tells us of ‘red fogs,’ which they sometimes encounter especially in the neighbourhood of the Cape de Verde Islands.” In other parts of the sea, they meet showers of dust. What these showers precipitate in the Mediterranean is called, “Sirocco dust,” and in other parts “African dust,” because the winds which accompany them are supposed to come from the Sirocco desert, or the parched land of the African Continent. It is of a brick-red or cinnamon colour, and it sometimes comes down in such quantities, as to cover the sails and rigging, though the vessel may be hundreds of miles from the land.

Late microscopical observations have shown the very curious fact that this dust consists of infusoria and organisms whose *habitat* is not Africa, but South America, and in the south-east trade-wind region of South America. Professor Ehrenberg has examined specimens of sea-dust from the Cape de Verde Islands, Malta, Genoa, Lyons, and from the Tyrol, and he has found a similarity among them as striking as it would have been had these specimens been all taken from the same pile. In all, South American were the prevailing forms. “It may now be regarded as an established fact,” adds Maury, “that there is a perpetual upper-current of air flowing from South America to North Africa, and that this volume of air is nearly equal to that which streams to the southward with the north-east trade-winds.”

The mystic movements of the winds early at-

tracted the attention of mankind. One can hardly read the observations of holy writ, without being struck by the remarks of the sacred writers ; observations which modern investigations seem often so well to verify. We have seen how currents of air have been proved to cross each other, and so return back to their sources the streams of air which "the trades" and other winds have withdrawn. Thousands of years since, we find it observed that "the wind goeth towards the south and turneth about unto the north, it whirleth about continually, and the wind returneth again according to his circuits" (*Ecclesiastes* i, 6.). Job seems to have regarded as a mystery "the balancing of the clouds" (xxxvii. 16). But he was aware of how rain exhausted those clouds (xxxvii. 11). But how that rain was produced out of the cloud he merely inquires (xxxviii. 28). The smallness and gentle falling of the drops of rain had not escaped his attention (xxxvi. 27). Modern philosophers once disputed whether dew descended from heaven, or was emitted from the earth. It has long been decided that Solomon was right when he said that the dew "drops down" (*Proverbs* iii. 20); and as Zechariah says (viii. 12) "from Heaven." There are many other observations scattered through Holy Writ which seem to be not a little remarkable, when viewed in connection with modern scientific researches. For instance, it is now more than suspected that the sun, with all its planets and their satellites, are *moving* around one vastly larger centre, and that that central sun, is very likely to be one of the Pleiades. Job asked, thousands of years ago, (xxxviii. 31) "Canst thou bind the sweet influences of Pleiades?"

Dew.

The insensible vapour, of which we have noted the birth, in the evaporation from the earth's surface, appears again on the earth in its first and softest way in dew—a phenomenon full of interest. Travel where we may, dew seems to be ever ready to descend ; to bless our thirsty soils, and give life to the vegetable world. With us, it has been calculated to amount, soft and insensible as is the descending stream, to five inches of water in depth every year, or 500 tons per acre. Many interesting observations rivet our attention with regard to dew. Its deposition is found to be greater in valleys, and near to running waters, than in dry elevated situations ; in fact dew is almost always to be found in such low lying situations after the sun is down. This dew sometimes extends to considerable distances from the stream. Similar observations have been made in the East Indies. Colonel Sykes (*Trans. Roy. Soc.* 1850, p. 343), observed in Mohol that garden produce, which is there usually irrigated during the day time, is covered with a copious dew every morning. The lands bordering the gardens for 40 or 50 yards around were slightly sprinkled with it, but there was not a vestige of it beyond that distance ; hence he inferred that aqueous vapour had been taken up by the action of the sun during the day, suspended over the spot, and deposited by the lower temperature of the night as dew upon the land. In other observations

made at Poonah, he found that in September and October, when there was not any dew in the cantonments, or in the fields of standing grain, it would yet be found on the banks of rivulets ; but in these, 15 to 20 feet from the water were the limits of the deposition. These phenomena are chiefly remarkable in calm weather.

When by the cooling of the surface of the earth the aqueous vapour is condensed and becomes visible, we call it dew ; if the temperature of the earth is reduced below 32° that dew becomes frozen, and then we call it hoar-frost. This was another of the meteorological mysteries which sorely puzzled the early dreamers of philosophy. The alchemists had a wild notion that dew was an exudation from the stars ; they manipulated upon it in all kinds of unmeaning ways, since they hoped to find in it gold ; great were the disputes amongst later enquirers as to whether it came from the atmosphere or the earth. The explanation originally given by Wells is that now commonly received, viz. :—that it is an effect of a decreased temperature of the portion of air in immediate contact with the soil. When the earth, during the day, becomes heated, the vapours ascend in a current ; but when towards evening the force of this ascending stream diminishes, they descend again towards the earth. After the sun is set, the weather calm, and the sky serene, the soil radiates, and thus its temperature descends several degrees lower than that of the stratum of air immediately resting upon it, then, as Von Kaemtz observes, the phenomenon of the precipitation of vapour on a cold glass, when brought into a heated room, takes place on a grand scale, and the grass is covered with dew. This fall of temperature always precedes the formation of dew. The greater the fall of the thermometer on the surface of the soil, the greater is the amount of dew deposited. The agriculturist and the gardener are well aware that nights with heavy dews are very cold ; but this cold is the cause not the effect of dew.

Everything which opposes the radiation of heat, a screen either above or beside the object, for instance, prevents the formation of dew. Plants placed beneath a tree are less wetted than others which are unshaded. I have constantly noted that the deposition of dew under trees on my lawn varies considerably with the kind of tree. Under a wych elm there is rarely any deposition on the grass beneath ; under the oaks immediately adjoining, the deposition is early and copious. It is necessary for the deposition of dew, that the sky should be unclouded, and little or no wind. When the sky is clouded indeed, there is but little radiation, so there is no cooling of the soil, and consequently no condensation of dew. When there is wind, the same effect is produced, for then a current of warmer air carries off or preserves the temperature of that which is immediately in contact with the cooling soil. The accumulated clouds often portend rain, and as they prevent the formation of dews, hence comes the old weather observation, that "absence of dew on the grass portends approaching rain."

The deposition of atmospheric moisture in dew is not confined to the surface of the soil ; wherever

the atmospheric air can freely penetrate, there the deposition of dew under favourable circumstances takes place. This also often occurs in the interior of a soil when evaporation is taking place from the surface. The pulverization of the soil, therefore, by promoting its power of absorbing the atmospheric aqueous vapour, increases its fertility. Dry soils, even the driest contain about 10 per cent. of moisture. We know that when soils are dried in a temperature of 212 degrees, and exposed on their surfaces to air saturated with moisture, they absorb very considerable portions of water. Suppose a soil which weighs about 1,000 tons per acre was pulverized so as to be freely permeable by the atmosphere, and that such a soil, after being thoroughly dried, was exposed to the air, then we find from the experiments of Schubler that it would absorb of water in twenty-four hours—

If a sandy clay	26 tons.
Loamy clay	30 "
Stiff clay	36 "
Garden mould	45 "

If, however, the efforts of the husbandman in this may tend to increase the supply of atmospheric moisture, his labours in another direction sometimes diminish it.

"It is evident," says Dove, "that a vigorous vegetation produces rain, which, on the other hand, again nourishes that vegetation; and that the senseless destruction of forests has thus often destroyed the fertility of a district."

Previous to 1821, Provence and the Department of the Var possessed an abundance of brooks and springs. In that year the olive trees, which there almost formed forests, were killed by the frost, and they were cut down to the roots in 1822; since which time the springs dried up, and agriculture suffered. In Upper Egypt, eighty years ago, springs were still abundant, but they have ceased since the Arabs cut down the trees in the Valley of the Nile, towards Libya and Arabia. A contrary effect has been produced in Lower Egypt through

the extensive plantations of trees by the Pasha. In Alexandria and Cairo, where rain was formerly a great rarity, it has since that period become much more frequent.

The somewhat different way in which the leaves of plants appear to act in the receiving and disposal of dew was noticed by Mr. J. Parkes (*Journal R.A.S.*, vol. v. p. 133). "A blade of grass," he observes, "is sometimes spangled over with dew-drops, but it usually becomes wetted through its whole surface, by the running together of the drops, and thus conducts the water to the earth in minute streamlets; whereas the leaves of the clover, nasturtium, and many other plants, will be found to collect it in distinct globules, which may be rolled about on the leaf without appearing to moisten it. These drops, in fact, do not touch the leaf, but rest and roll upon a pillow of air interposed between them and the substance of the leaf. On very translucent nights I have seen the tender clover leaf bend beneath the weight of its crystal load, discharge it on the ground, and immediately begin to accumulate another globule. Cup-formed and horizontal, leaves and flowers, seem to retain all or very nearly all their collected dew for their special use, as if it were more beneficial to them when so applied than to their roots."

We have thus traced the vapour of the atmosphere from its various sources, till it again appears as cloud, or descends as the fog or dew. We have marked that dew gradually accumulating till it became united in drops, and then either rolling off the surface of the leaves of plants in crystal globules, or in streams of dew-water. But these bright drops are almost as often formed at, and descend upon us from considerable elevations; and here, again, we find in the rain-drop other sources of interest and instruction. But these are too copious to be merely viewed as the concluding portion of our present essay; I propose, therefore, to recur to the raindrop on a future occasion.

THE ROTATION OF CROPS, AND THE REASON.

The practice of agriculture consists of a series of operations, by which we endeavour to raise from the land the most valuable produce it is capable of yielding, with as little cost as possible, and with the least injury to the soil. An ignorant person might manage to draw from the land very heavy crops of corn for a short time, and in doing so he might seriously damage the property. Whereas, another, possessing a practical knowledge of good systems, might succeed in realizing the same value of produce without injuring the character of the land. It has therefore been accepted as an established principle, that a judicious succession of crops is advantageous for aiding the farmer to produce the best crops he can with the least detriment to the land. Experience proves to every observant person, that, under our ordinary practice, the repeated growth of any crop upon the same piece produces a gradual de-

crease in the quantity which the land is capable of yielding. This takes place more rapidly in some soils and under some crops than others, but the same fact stands out in all the light of an accepted truth. Now to what causes can we trace this? The only two changes which the plant can have produced in the soil are the addition of noxious-matter and the abstraction of fertilizing-matter. It has been well argued that a plant, during the period of its growth having received from various powers its supplies of food, appropriated for the purposes of its own development such matter as it required, and ejected by its roots, as excrementitious matter, that which was of no further use. It was further believed, that as the soil became more and more fully charged with such excrementitious matter, the growth of the crop became less luxuriant because of the soil being charged

with that which was believed not only to be worthless for promoting the plant's growth, but positively injurious. In the case of animals this is observed very plainly; and the peculiar aversion which beasts manifest to their various excrements shows the means which Nature has planted in each to lead them to avoid that which would be, not only useless, but really injurious. This explanation was very generally accepted for many years; and it was a very reasonable mode of explaining the observations of practice. It appeared to be corroborated by the fact that after the soil had been exposed to the air by the process of cultivation, the land became "sweetened," as they termed it, and then was again ready for the production of the same crops; whereas, if the land were kept as much as possible from the atmosphere, then the crop still failed to be productive. Although this explanation appeared very simple, yet, being destitute of satisfactory proof, it only held this position until its successor came into notice.

The claims of its rival were based upon the exhaustion of the land, and its principles are simple. Every crop removed from the land, takes from it a certain quantity of mineral matter which the land had yielded in its growth. Every successive crop of the same plant having removed similar materials, the proportion of those ingredients of the soil which remained was thus gradually reduced by every crop. If the soil were rich, it could withstand the attack for a longer period of time than if it were poor in quality; and this fact alone leads us to see the cause. If we have a soil rich in the inorganic elements required by the crop, such a soil could bear a longer succession; but, if deficient in these mineral matters, a more speedy failure of the crop is the result.

Should a soil possess some of the ingredients in abundance, whilst others which are essential to the growth of the crop are deficient, the productiveness of the soil will be regulated by the latter. Thus land may be exhausted of certain ingredients which the crop requires, and consequently becomes incapable of producing it in luxuriance, or even in a remunerative degree, whilst it may still possess all the other ingredients in abundance. For crops, therefore, which relied upon those materials yet remaining in the land, it would still be fertile or productive.

This explanation has been very generally accepted as a substitute for the excrementitious principle before-named; and there is much truth in the argument based upon the exhaustion of the soil. Still we are far from being disposed to consider this as fully explaining the principles which are embodied in this in-

teresting subject. We must ever remember, that, whilst we seek truth, we must not rest upon a few fragments, although they may be in themselves perfectly correct; that in the functions of vegetable life *many* principles are involved. Let us prize each as we discover them, and await with patience and persevering industry until we have gained those that remain. These will ultimately dove-tail in with those we already know, and render the series complete. Whilst, therefore, we cannot consider that the necessity for a judicious succession of crops which will favour the fertility in the land depends solely upon the exhaustion of the mineral ingredients of the soil, yet we are fully justified in stating the fact that it has a powerful influence upon the result, and is worthy of a very careful consideration.

In another page of this magazine we have inserted a table, which will give the reader a clear view of the mineral matter which our crops contain. As the soil is the only source from which these materials can be procured, it will be evident that without a due consideration of these facts, we cannot have safe information to guide us, either as to the best succession of crops, or enable us to compensate the natural deficiency so produced in our soils, by the aid of manures.

There is a remarkable difference in the food required by different crops. For example, our corn crops take from 65lbs. to 140lbs. of silica per acre, but other crops from 6lbs. to 20lbs.; whilst the root crops make a demand upon the soil for the alkalies (potash and soda) far in excess of that required by the corn. In like manner, we observe other equally important and singular differences in the demands made upon the soil. This variation in some measure explains the adoption of certain rotations, whereby the crops are placed in that order of succession which will distribute the demands as much as possible, instead of allowing them to concentrate too much at any period of the course. It must not be supposed that the credit arising from the adoption of our established rotations belongs to those who have discovered these principles; for such is not the case. Successful practice having given remunerative proof of success, led to such an established order; and afterwards by the assistance of scientific investigators we discovered some of the causes for this method. Practice showed that to obtain success certain crops had to be distributed through the course, and separated from each other, whilst other crops answered well in immediate succession. We have so far drawn attention to the data by which these singular facts can be explained, and shall next more fully elucidate this most interesting branch of rural economy.

THE LAMBING SEASON.

I have now for several years ventured annually to give a few hints on the management of the breeding flock in the lambing season. I take the liberty of again reverting to it, as one of paramount importance at this pre-

cise time. I have nothing new to advance of any particular value; but even the repetition of old and well-known practices may be of some service to old readers; and as I know that new readers rapidly increase,

I am not careful to offer any apology for presuming to write a short annual paper upon it, and I shall be very pleased if any remark I may make may become useful.

The lambing season is always looked forward to, by all flockmasters, with very considerable anxiety. It is an universally acknowledged truth that the breeding flock cannot be kept in any other than a quiet, even, progressive state, without endangering their safety in the lambing season. To do this, a season of comparatively even temperature is required, and the food should be of uniform character and quality. How then can rough and stormy weather, or successive frosts and thaws, snows and rains, be provided for, or assimilated by management to this? Well, the flockmaster must try. If the grass lands are deeply covered with snow, the flock must have mangolds, hay, and cut chaff given out. If continuous rains, plenty of hay chaff or other dry food. If the flock is wintered on turnips or cole-seed, the task is not so difficult. A liberal allowance of hay, straw, or other dry food in cold weather, with dry lairs and shelter, will keep the flock all right. The chief thing in the latter case is to take care that the turnips are good in quality, and of like kind, *i. e.*, not frozen or decayed. It is not good or safe practice to feed them on common white-fleshed turnips, and then suddenly revert to swedes, or other yellow-fleshed turnips, immediately before lambing; the latter is not of much importance, as they assimilate more to the white varieties than swedes. I have known severe losses occur from this change, when on the point of lambing. I repeat, the ewe flock should be wintered with great evenness and regularity as to keeping, and, if possible, be kept in a sound store condition; not too fat—certainly not too poor. We may devise many various schemes for ensuring a successful lambing season; but if the animals are not carefully attended to, and properly prepared for it, in the winter, all will be in vain.

If the ewes, then, are in fair average condition for lambing, a good supply of milk may be anticipated—the one thing needful for ensuring a good “crop of lambs.” Very, very much depends upon this. Why do so many flocks of lambs winter badly? It is because they were pined when young, and thus had their constitutions weakened. The flock-master should not scruple about the cost of food in the lambing season. If the ewes are not well and regularly fed, the lambs soon give evidence of failing strength. A good breadth of seed-land laid in through the winter is one of the best places for young lambs, and warm sheltered pasture fields the next, with plenty of room. In many districts it is the common practice “to lamb the ewes on turnips:” here, then, they have, without difficulty, a regular supply of the same kind of food; but when on grass lands, they must be supplied with artificial food, as roots, cake, corn, chaff, hay, &c. In such cases danger frequently arises; one animal will eat voraciously of roots; another of chaff, or corn, or hay, &c.; indigestion followed by fever is then too often fatal. I have for many years lambed my ewes on grass lands, giving them a plentiful supply of mangolds and cut chaff; but I cannot speak with

every confidence as to the suitability or safety of mangolds to the ewe flock at this time; in very cold weather they are frequently injurious to them, causing flatulency and scouring, and not unfrequently casting or sinking of the lamb. I incline to prefer turnips or swedes, but in my position I am almost necessitated to resort to mangolds. In this district we grow excellent and safe crops of mangolds, while our crops of swedes are precarious and indifferent. My corrective against the succulency and flatulency of the watery mangolds is plenty of oat sheaves cut into fine chaff and given freely, in the field where the ewes are collected for lambing; and as they lamb, they are drawn out into seeds or “laid in” pastures, and a moderate allowance of mangolds is continued, and chaff to the weaker ones selected out.

It is imperatively requisite to provide suitable lambing paddocks or pens for the lambing season, to which the ewes can be taken every night. In them, and also about the pasture field, or adjoining fields, shelter pens should be constructed, into which a ewe about to lamb, or immediately after she has lambed, should be put, if the weather is unfavourable. These pens are of homely make; mine are made with straw-wattled hurdles; five hurdles making a double pen, three being set down parallel with each other, and so near that the two other hurdles, or trays, form the back and front. As the season draws nigh every preparation is made, and the allowance of food is increased. The ewes being heavy with lamb, require additional support, and in fact they must have it, or certain loss will result. When their “time is up,” my ewes are constantly watched for a few days upon the pastures where they have been wintered. As soon as the lambs begin to fall, they are collected into a roomy field, provided as above, in the corner of which, adjoining the shepherd’s house, is the lambing paddocks, into which they are driven every dark and unfavourable night. In fine open moonlight nights they are sometimes left out, as it is desirable that the paddocks or lambing pens should be freed from taint, *i. e.*, be sweetened occasionally. Tainted straw or gangrenous droppings are sometimes fatal to ewes if they come in contact with the wounded uterus. Or should any epidemic arise, or typhus or other inflammatory fevers occur, close contact should be avoided, and the suffering animals ought at once to be carefully carried to a distant and suitable place, and there be nursed. On the large farms upon the Downs and Wolds, and in many other parts of the country, ewes are generally, if not universally, lambed while on turnips. In such cases lambing yards, or pens of sufficient capacity, should be provided, with a temporary house for the shepherd. It is constant and untiring attention that is required. It is only in special cases that the shepherd’s skill and experience are brought into requisition.

The Treatment of the Ewe.—I have so often described the common mode of treatment, that it seems superfluous to repeat it; however, I will concisely reiterate it. The ewe about to lamb must be examined by the shepherd to ascertain that all is right. This being found correct (*i. e.*, the nose and fore-feet in front,

and ready to come forth), she should be left awhile to her own efforts. Should her pains be protracted, the shepherd must lend assistance, or the lamb will be dead ere it is brought forth. The ewe should be gently laid upon her side: the shepherd should then draw one foot forward after the other, and then by a steady pull draw the lamb away. If the lamb is wrongly presented, then comes the difficulty and danger: the shepherd has to push it back most frequently into the lamb-pouch, there turn it, and by the ewe's pains, and his guidance and help, it is often brought away without much damage. The ewe, in all cases of severe labour, should have a small table-spoonful of laudanum administered, to keep her from paining till the parts become easier, followed in a day or two by a small dose of Epsom salts, and warm cordial drinks or gruel, and suitable food, such as hay, chaff, and sliced turnips or carrots.

In case of Fevers or Inflammation after Lambing.—In the first case, it is not often right to resort to bleeding: gentle purgatives and diuretics are best, with saline gruels and mild food. In the latter case lambing oils, as a rule, do far more harm than good. I never knew a

case of the internal application of these "sheep oils" to be of much service, and have long since discarded them altogether, and resort to hot fomentations in cases of apprehended gangrene, and to cold water and cool dry lairage for subduing inflammation. The cold water should be poured gradually from an elevation, over the loins and hinder parts for several minutes together, and be often repeated till the inflammation subsides, taking care that the ewe is not exposed to draughts or heats. She must afterwards be nursed with great care, and that for a lengthened period.

The Lamb.—This should be cleared of all adhesions around the nostrils as soon as it is born, and very soon afterwards suckled. It will then, in mild weather, bear many privations. The ewe's udder should be cleared of wool, to prevent its being drawn in by the lamb. The castration should take place about fourteen days after birth, on a mild, damp morning. As the ewes lamb they should be drafted off to other pastures, and the lambs ought there to have access to a fenced enclosure, where they can enjoy a ration of corn and cake to themselves. P. F.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL.—Wednesday, February 6th, present, the Earl of Powis, President, in the Chair, Lord Berners, Lord Feversham, Lord Macclesfield, Lord Tredegar, Lord Walsingham, Sir John Johnstone, Bart., M.P., Sir Watkin W. Wynn, Bart., M.P., Hon. W. G. Cavendish, M.P., Hon. Col. Hood, Hon. A. Vernon, Mr. Raymond Barker, Mr. Barthropp, Mr. Bramston, M.P., Mr. H. Brandreth, Mr. Caldwell, Col. Challoner, Mr. Exall, Mr. Frere, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Wren Hoskyns, Mr. Howard, Mr. John Hudson, Mr. Jonas, Mr. Lawes, Mr. Lawrence, Mr. Shuttleworth, Professor Simonds, Mr. Thompson, M.P., Mr. Torr, Mr. Owen Wallis, Mr. Jonas Webb, Mr. Burch Western, Mr. Henry Wilson, and Dr. Voelcker.

The following new members were elected:—

Abraham, Rev. T. E., Barton Place, Milden Hall
Cartwright, John, Shrewsbury.
Cooke, William C. E., 26, Spring Gardens, S.W.
Congreve, Thomas, Leamington Hastings, Rugby.
Fiddes, Thomas F., Handbridge, Burnley
Galpin, Mr. George, Kingston Farm, near Dorchester
Gregory, George, Crowhurst, Battle.
Greene, William, Ditcham Park, Petersfield
Hack, James Carter, Springfield, Chelmsford.
Hall Dare, F. M., Ilford Lodge, Essex
Jay, Mr. John, of New York.
Lambert, Robert de, Common Head, Staveley, near Kendal.
Mac Rae, Dr. Archibald, Brynack, by Beaulieu, Inverness-shire.
Palmer, Thomas, Stoke Chingland, Callington.
Richardson, T. M., Hibaldstow Grange, Kirton-in-Lindsey.
Tennant, Joseph Mason, Headstow, Leeds
Tennant, Thomas, Bleaheim Terrace, Leeds
Thomas, John, Bletsoe, Bedford.
Witherington, Mr. C., Bradfield, near Reading.

On the proposal of Mr. Jonas Webb, seconded by Lord Feversham, the Right Hon. Lord Walsingham was

unanimously elected Vice-President in the room of the Earl of Hardwicke, resigned.

FINANCES.—The Hon. Col. Hood, who had been elected Chairman of the Finance Committee, presented the report. The Secretary's receipts during the past two months had been examined by Messrs. Quilter and Ball, and were found correct. The balance in the hands of the bankers on January 31st was £3,600 5s. 2d., including a contribution of £1,500, which had been received from the Leeds Local Committee.

JOURNAL.—Mr. Thompson, M.P., Chairman of this Committee, explained that the illness of a contributor prevented his laying on the table the forthcoming number of the Journal, which will probably be issued during the ensuing week.

CHEMICAL.—Mr. Wren Hoskyns, Chairman of the Committee, presented Professor Voelcker's Annual Report (to be read at the meeting on Wednesday, the 20th instant), containing the result of analysis made for members, of Soils, Manures, and different Feeding Materials, and detailing the results of other Laboratory investigations during the past year. These have formed the subjects of three papers contributed to the last No. of the Journal:

1. On the Composition of two varieties of Kohl Rabi.
2. On the Chemical properties of Soils.
3. On the Composition and Nutritive Properties of Mangel Wulp.

Also of two papers, which will appear in the forthcoming Number:

1. On the Composition of the Yellow Lupine, and the Soil adapted to its cultivation.
2. On the Apatite Beds of Norway, Spanish Phosphorite, Coprolites, Rock Guano, and other Phosphatic Materials now used for manuring purposes in this country.

The field experiments on wheat, barley, and turnips have been proceeded with, and those on turnips will form the subject of more than one paper in the future Numbers of the Journal.

The results of the investigations made by Professor Voelcker last summer in the manufacture of cheese and butter have been recommended by the Committee to form the subject of a lecture to be delivered in May next.

The Committee have, in consequence of a suggestion from the Professor, directed him to make the composition and comparative qualities of different kinds of straw one of the subjects of laboratory investigation, should this be compatible with the investigations in cheese and butter, and the field experiments.

ADMISSION OF MEMBERS TO SHOW YARD.—Lord Feversham, Chairman of the Committee, presented the following report, which was adopted:—

"The Committee recommend that the Governors and Members of the Society be admitted to the Show Yard, free from payment, during the time it is open to the public.

"That the Governors and Members who have paid their subscriptions for the current year are to be admitted free by tickets issued by the Secretary, which ticket shall not be transferable; and any Governor or Member of the Society who shall be found to transfer or lend his ticket shall be reported to the Council, and shall in future forfeit the privileges of Membership.

"That each Member shall sign his name, and write his address, with a declaration of his Membership, on the back of the official ticket, and shall also sign in the Gate-Book at the Special Entrance, if required to do so.

"That application for the Member's ticket be made in London, either by post or personally, not later than Friday the 12th of July, and afterwards at the Secretary's office in the Show Yard."

VETERINARY.—Mr. Raymond Barker, Chairman of the Committee, reported the following recommendations, which were adopted:—

"The Committee recommend that an office, with proper facilities of water, &c., be constructed in the Show Yard for the use of the Veterinary Inspectors.

"That in future it shall be considered part of the Veterinary Inspectors' duty to give their professional assistance in case of illness amongst the stock exhibited in the Show Yard, unless objected to by the owners.

"That each of the Veterinary Professors may be allowed to introduce into the Show-yard two of his pupils as his assistants.

"That no horse shall be exhibited without a certificate from a Member of the Royal College of Veterinary Surgeons as to the state of the animal with reference to hereditary diseases, particularly those of the respiratory organs, which certificate shall accompany the Certificate of Entry; but that the above shall not supersede the usual examination by the Society's Veterinary Inspector."

It was recommended that a request be made to the Leeds local committee to take steps for ensuring a supply of good hay and green forage for use during the country meeting.

The annual Report from the Governors of the Royal Veterinary College was received and ordered to be read at the next Weekly Council.

IMPLEMENTS.—Col. Challoner, who had been elected Chairman of the Committee, presented the report, which recommended that for—

DRILLS.—The General Purpose Drills, both for large and small occupations, must be adapted for all kinds of corn and seeds, manures dry and moist, in quantities varying from 3 to 40 bushels per acre, and to have either fore or hind steerage.

The Small Occupation Seed and Manure Drill will not compete with the Drill of a higher price, as its price to the purchaser will be a material consideration.

The Turnip Drills must be adapted for the ridge and flat, and for manures both dry and moist, in quantities varying from 3 to 40 bushels per acre.

HORSE HOES.—The Horse Hoes in Class 3 should be adapted to set out Turnips at various widths, and leave the plants in such a state that they can ultimately be singled by hand.

Horse Hoes should be adapted to ridge and flat work, and to work in widths from 8 to 27 inches.

The MANURE DISTRIBUTOR will be preferred which is best adapted for distributing any kind of artificial manure when in a moist or dry state; and which is capable of adjustment for the delivery of any quantity from 3 to 40 bushels per acre.

The Leeds Local Committee, in a letter dated Feb. 2nd, had stated their inability to provide the land required for the trial of steam-cultivators in April, except at an extensive cost.

GENERAL LEEDS COMMITTEE.—Lord Walsingham presented the report, which recommended that steam-cultivators should be on the ground on or before Monday, July 1, and that the trials should begin on Tuesday, July 2, and that the prizes should be adjudged at the Leeds meeting; and that that decision should not be made dependent upon a further autumnal trial, unless decided by the stewards and judges to be absolutely necessary. The Committee consider that great importance is attached at Leeds to these prizes being made known at the meeting; for which object large subscriptions have been raised.

Presents of Books to the Library were laid on the table, comprising—Magnetical and Meteorological Observations made at the Observatory at Bombay in the year 1858, forwarded by the Secretary of State for India; the United States Patent Office Reports for 1857, 1858, and 1859; the Transactions of the New York State Agricultural Society for 1859; the Transactions of the Agricultural Society of Bavaria, with a Pictorial Almanac for 1861, published at Munich, and forwarded by His Excellency the Bavarian Minister.

The Council then adjourned over Ash-Wednesday to their weekly meeting on the 20th inst.

WEEKLY COUNCIL: Wednesday, Feb. 20.—Present: Mr. Raymond Barker, Vice-president, in the chair; Lord Berners, Hon. W. G. Cavendish, M.P.; Hon. Col. Hood, Hon. A. Vernon, Sir E. C. Kerrison, Bart., M.P.; Mr. Dent Dent, M.P.; Mr. Frere, Mr. Goodwin, Mr. Slaney, M.P.; Professor Simonds, and Mr. Burch Western.

The names of candidates for election having been read, The Annual Report from the Governors of the Royal Veterinary College was read as follows:—

ANNUAL REPORT OF THE GOVERNORS OF THE ROYAL VETERINARY COLLEGE TO THE COUNCIL OF THE ROYAL AGRICULTURAL SOCIETY.

The Governors of the Royal Veterinary College, in accordance with annual custom, have again the satisfaction of presenting their Report relative to the state of veterinary medicine, and the means which are at their disposal to further its application to the wants of the agricultural community. During the past year the lectures on the diseases of cattle, sheep, and pigs have been uninterruptedly delivered, and the daily attendance of the pupils has been fully equal to that of

any former year. Examinations to test the proficiency of the pupils have from time to time been instituted, and from the reports which have been furnished to the Governors by the Professors, they believe that the progress of the pupils in the several departments of their studies has been very satisfactory. To second the labours of the professors, and to stimulate the pupils in the acquirement of knowledge, the Governors, early in the year, arranged for the application of certain funds placed at their disposal by the late Professor Coleman, to the awarding of medals of silver and bronze, and a certificate of merit as honorary distinctions of the first, second, and third class, to such pupils as should be the authors of the best essay on a selected subject of veterinary medicine. The subject chosen for the competition was, "The eye of the horse, embracing its anatomy and physiology, the laws of light appertaining to vision, the chemical composition of the humours, and the pathology, treatment and results of the disease known by the name of constitutional ophthalmia."

The conditions were—1st. That the essayists should write within the college, and that the time be limited to three hours a day, for six consecutive days. 2nd. That their papers should be in the custody of the Demonstrator of Anatomy. 3rd. That no reference to books would be allowed. 4th. That each paper should be superscribed with a motto, and be accompanied by a sealed envelope bearing the same motto, and containing also the name of the writer.

The successful essayists were:—

Mr. Francis Talbot Sharp, Nottingham, Silver Medal.

Mr. George A. Oliphant, Marshwood, Southampton, Bronze Medal.

Mr. William Barker Walters, Birmingham, Certificate of Merit.

Although an important malady affecting the horse was thus first chosen, such being in accordance with the wish of the donor, it is the intention of the Governors in future years to select in turn a subject in connection with the pathology of cattle, sheep, and other domesticated animals; as also upon chemistry and Materia Medica.

COMMUNICATIONS AND CASES.—It is a source of much gratification to find that an increased number of communications, seeking advice for the management and treatment of diseased animals, has been received from the members of the Society, and also that a great many morbid specimens have been forwarded from different parts of the country, thus affording increased facilities for the student to become practically acquainted with cattle pathology, at the same time that the principles of the science are being expounded to them in the lecture room. The benefit which must result from the continuous adoption of this plan cannot be too highly estimated, as it is an assurance to the agriculturist that those pupils who daily enter on the practice of their profession, as graduates of the College, are equally well informed on the nature and treatment of the diseases of cattle and sheep as they are on those of the horse. The Governors have long seen the advantages resulting from this co-operation on the part of the members of the Society, and which they view as second only in importance to their obtaining the personal attendance of the professor of cattle pathology on cases of disease which may assume a more urgent type. Hence in former reports they have not failed to direct special attention to this subject, as well as to urge such a modification of the Society's rules which apply to the obtaining of the professor's services, as to lead to their being simplified, and they learn with great satisfaction, that their recommendation has not only been entertained by the Council, but that in due course it will be carried into practice. A very limited number of cattle and sheep have been received into the infirmary for treatment, and the Governors cannot help reiterating their surprise at the apathy which prevails so generally among agriculturists to avail themselves of the privileges they possess in this respect as members of the Society.

ANNUAL MEETING.—At the meeting which took place at Canterbury both Professor Spooner and Professor Simonds were in attendance as Veterinary Inspectors, and the Governors have observed with very great pleasure that in this effort of theirs to render benefit they have succeeded to the satisfaction of the Society. The rigid examination to which all the animals are now subjected is gradually lessening the number of incorrect returns with reference to their age, and

correcting also the abuse of sending for exhibition those which are the subject of hereditary disease. The examination of the horses has, however, often been less satisfactory to the inspector than he could desire, arising chiefly from the limited means at his disposal, and the Governors doubt not that at the approaching meeting at Leeds any increased facilities he may require by a modified arrangement of the sheds, so as to set apart one exclusively for his use, and the supplying him with practical assistance in his investigations into the soundness of the animals, will be readily granted by the Council.

PREVALENT DISEASES.—Apart from ordinary diseases, the chief maladies of a serious nature which have prevailed among cattle have been pleuro-pneumonia and epizootic eczema, commonly known as the mouth and foot-disease; while among sheep, at the early part of the year, chronic diseases of the lungs, resulting from the existence of worms (filaria) within the bronchial tubes during the preceding autumn, proved very destructive. No doubt but the fatality of this disease was greatly added to by the long-continued wet weather and low temperature which prevailed. It is, however, to be feared that these same causes have had even a far greater injurious effect on the health of sheep in producing that fatal malady which is commonly known by the name of "rot." At the present time this destructive disease is wider spread than has been the case for many years; and in several of the western counties it is to be feared from the recent investigations of the Professor of Cattle Pathology, that whole flocks will be sacrificed to its ravages. Little can now be done to prevent these losses, the malady being one which has had its origin in the entrance of entozoa into the organism of the sheep, and during the preceding summer months. In their more perfect form these entozoa are known by the name of flukes, and are found to be inhabiting the gall ducts of the liver, where they not only produce functional derangement of the organ, but early lay the foundation for irremediable structural changes. The study of the natural history of these creatures opens up the only chance of preventing their attacks, and thus to save the lives of our sheep; and it is gratifying to find that investigations of this kind have long since been undertaken by the Professor of Cattle Pathology, and which are satisfactorily progressing. With reference to pleuro-pneumonia, the Governors would observe that several circumstances have shown during the past year in a most remarkable manner that the main cause of the spread of this disease is contagion. Such is its introduction into the United States, and also into Australia; the outbreak depending in the former country on the importation of some cattle from Holland, and in the latter on a similar importation from England. Within the past week it has also come to the knowledge of the Governors that the malady has been carried into Norway by some Ayrshire cows sent from Scotland. Facts of this kind are of the first importance, as indicating the means which should be adopted to limit its extension. Preventive measures are alone to be relied on, as the fatality attending the disease can be scarcely said to be diminished since it first made its appearance in this country; nor is it to be hoped that science can do more than she has already done in devising means of its cure. In conclusion, the Governors would again convey to the Council their fixed resolve to do everything within their power to render the science of Veterinary Medicine of increasing value to the agricultural community.—*J. W. Bosanquet, Treasurer of the Royal Veterinary College, Jan. 12, 1861.*

A report from the Veterinary Professor of his professional visit to Bridgerule, in Devonshire, was read as follows:

ROYAL VETERINARY COLLEGE.—On the 14th of December, 1860, in accordance with instructions received from the Council, I visited the parish of Bridgerule, North Devon, for the purpose of investigating a fatal malady existing among the sheep in that and adjoining parishes. The application came from the Rev. S. Kingdon, the resident Minister, and an old member of the Society, who stated that "more than half of the sheep had died or been sent off to be slaughtered at Plymouth." It was suspected that the animals were suffering from "rot," but a doubt existed

on this point with regard to many of them, in consequence of the statements made with reference to the condition of the body after death. An investigation of the symptoms satisfied me that the disease was rot in its most malignant form, and the doubt referred to I found to have had its origin in a want of knowledge of even the most simple facts of the animal frame. As I found indications of the disease in all the animals to a greater or less extent, without reference to their age, and as many were ewes in lamb, I deemed it prudent to select on the different farms some for slaughtering, with a view to determine if the individual proprietors would be justified in keeping them a sufficient time to produce and rear their lambs. In every case I regret to say that such was the advanced state of the malady that I could not advise any other course being taken besides that of disposing of the animals at a low price as quickly as possible. Inquiries since made show the propriety of this course; and it will appear from a report and details of particulars, furnished by Mr. Kingdon, and attached hereto, that where the recommendation was not acted on the animals are being swept daily away by death. This parish forms no exception unfortunately to the existence of rot among the sheep; and it is a serious thing to contemplate the great amount of loss which the country as a whole will sustain from the disease. Few districts can be found perfectly free of the malady, but especially does it prevail on wet, cold, and undrained lands. Late investigations into the natural history of the entozoon—the liver fluke—on the presence of which in great numbers within the biliary ducts the disease depends, would cherish the hope that ere long preventive means may be adopted to limit their development, and thus save the lives of many of our sheep.—*James B. Simonds, Veterinary Inspector.*

The total number of sheep lost or sold at a reduced price in this parish was 359, out of an original stock of 492.

An interesting conversation ensued, in which Lord Berners, Mr. Frere, Mr. Dent Dent, Mr. Slaney, Mr. Barker, Sir E. Kerrison, and Mr. Goodwin took part, in which information was sought as to the origin of and cure for this prevalent disease.

Professor Simonds stated that investigations into the natural history of flukes are now being instituted. Experiments had some time since proved that the ova of tapeworms became developed into hydatids, but science until of late had done but little towards unveiling the mystery connected with the liver fluke. It was not to be supposed that flukes originated in the coarse grasses of wet meadows, which grasses might be got rid of by efficient drainage, but rather that the plants were indications of dangerous spots.

The liver fluke did not immediately produce its kind from its ova, for these give birth to creatures much lower in the scale of organization, and which had to pass, when out of the body of the sheep, through a series of transformations.

The organism produced by the ova of flukes appeared to be identical with infusorial *Cercariae* met with in

water, especially when stagnant. But it was still a matter of doubt as to whether the *Cercariae* did not become parasitic to other creatures, such as small species of water snails, and in them undergo higher development before entering the stomach and intestines of sheep to undergo their last change, that of transforming into flukes, which would find their way into the biliary ducts of the liver and lay the foundation for rot. Perhaps salt may prevent this development of the entozoa in the stomachs of sheep, as it is well known they do not become rotten on salt marshes.

Turpentine is of value in leading to the expulsion of flukes, and is one of our most valuable anthelmintics.

The following report was also read from Professor Simonds:—

I have to report that in consequence of an application made to the Society by Mr. H. Leeds, of Slibbington, Northamptonshire, I visited his farm on the 22nd ult., for the purpose of investigating a disease existing among his cattle. I ascertained that since Michaelmas last he had lost eight animals out of a small herd, and that he had hoped the malady had disappeared until a few days before his application, when a fresh case occurred. An examination of the animal in question satisfied me that it was the subject of an attack of pleuro-pneumonia, to which disease I have no doubt the other cattle had succumbed. There being no chance of recovery in this case, I had the animal slaughtered, with a double view of pointing out the nature of the affection to Mr. Leeds, and removing a source of danger to his other cattle by a spreading of the contagion. The post-mortem examination fully justified this step, as one lung was found to be so extensively diseased that it was completely destroyed as an aerifying organ. The outbreak in this instance is clearly traceable to the bringing into the premises some newly purchased animals. At about Michaelmas last, Mr. Leeds bought four young shorthorns, and very shortly afterwards one of them sickened and died. This was soon followed by the deaths of two more of the same lot, and then by the death of a ten months' old calf which he had bred. Besides this calf, four others have been carried off from the same disease, which with one killed for my examination make nine victims in the whole, being every one which as yet have been affected. I made a careful examination of all the other cattle which had been exposed to the contagion, and gave special instructions with reference to their management, so as to avoid as much as possible the bringing of secondary causes of the disease into operation. With the same view, I also directed that medical means should be at once taken to purge the system of the deleterious matter which had probably been received into the organism, and subsequently to lay the foundation for a supply of pure and healthy blood. Past experience, in numerous instances, would lead me to hope that the rigid observance of the rules laid down for the treatment of these animals will be attended with marked success in arresting the spread of the malady. The result, however, be what it may, will in due time be reported to the Council.

The report of the Consulting Chemist to the Society is as follows:—

REPORT.

During the past year, as usual, a large number of analyses of soils, guanos, marls, artificial manures, waters, oilcakes, and other feeding stuffs, have been made in my laboratory for members of the society. In many instances the analyses and reports supplied to members of the Royal Agricultural Society at a very moderate cost have afforded useful guides in the selection of the best articles of food and fertilizing materials. At the same time they have acted beneficially in checking dishonesty on the part of dealers in manures and feeding substances. It is gratifying to me to be able to report that only a few adulterated Peruvian guanos were brought under my notice during the past season, and that on the whole inferior artificial manures do no longer find the ready sale with which such manures were disposed of a few years ago. Indeed, downright bad manures are now quite the exception. Still, occasionally, fertilizers are sold at prices which bear no relation

to their intrinsic value. The following analysis of an inferior artificial manure, sold at an exorbitant price, may serve as an illustration of some six or eight other cases of a similar kind brought under my notice during the past season. The manure to which I refer was sent to me by Mr. John Ellis, land agent, Artington, Guildford, who bought it as Potter's guano.

Composition of sample of Potter's Guano sent by Mr. John Ellis, Guildford.

Water	30.73
*Organic matter	9.68
Phosphate of lime and oxide of iron and alumina	15.62
Chloride of sodium (common salt)	11.70
Sulphate of magnesia	1.39
Sulphate of lime (gypsum)	19.72
Carbonate of lime	5.38
Sand	5.18
	100.00
*Containing nitrogen	.18
Equal to ammonia	.21

It will be noticed that nearly one-third part of this so called guano is water, that another third part is gypsum, chalk, sand, and other useless matter, and the remainder contains a large proportion of common salt. The intrinsic value of this British guano is scarcely £1 10s., whilst it was sold at £7 per ton. It is not surprising that such a manure should have had little or no effect upon the turnip crop to which it was applied. Several kinds of sewage manures have been sent for analysis; but though sold at a low price they were without exception dear manures, considering the small amount of valuable fertilizing matter which they contained. Good superphosphates may now be obtained in almost every market at very reasonable prices. Inferior samples, however, are as abundant as good ones. I would remind the members of the Society that the appearance, smell, and other physical characters of a superphosphate offer little or no indication of its quality, and that the practical and commercial value of this and similar artificial manures can be accurately and expeditiously ascertained by analysis. I have also examined two excellent samples of Norwegian fish guano, a manure which is likely to be very useful to British agriculturists, provided it can be imported at a price proportionate to its intrinsic value. Whilst speaking of prepared manures I may mention that several complaints have been made respecting manures into the composition of which gas-refuse largely enters. I have as yet not been able to ascertain whether the clay and other materials used for purifying coal-gas contained, as is alleged, compounds injurious to vegetation. This subject is one of considerable practical importance, and deserves to be carefully investigated. In the meantime I shall feel indebted to any gentleman who may have used gas-clay or other gas-refuse manures, by favouring me with the result of his experience. With respect to feeding materials I have to report that good linseed cakes unfortunately are getting very rare. At least three-quarters of all the linseed cakes examined by me during the past season were either grossly adulterated, or were cakes of quite inferior quality. The practice of recrushing oilcakes, and mixing the powder with a certain amount of bran before replacing it into the presses, appears to be gaining ground. Good decorticated cotton cake has become much dearer, and is bought up as soon as it arrives in this country, and is consequently rather difficult to obtain of first-rate quality. One of the most useful oilcakes is green German rape cake. Several excellent samples were sent for analysis, and also some samples of common and of Indian rape cake. The examination of these cakes has strengthened my conviction, that whilst green German rape cake may be used with perfect safety, it is dangerous to give to cattle other kinds of rape cake, inasmuch as they frequently contain mustard in proportions injurious to animals. Recently attention has been directed to the probable importations of Egyptian dates in years of plenty. I have, therefore, carefully ascertained the composition of Egyptian dates, and published the analysis in the *Agricultural Gazette*. Another novel feeding material is compressed yeast. I have an analysis of this substance, which is now produced in large quantities in England, and find in it a considerable quantity of nitrogenized matters and of phosphates. Compressed yeast has been used for manuring purposes, but I was not aware until lately that it may be employed for feeding purposes. Two gentlemen, who are in the

habit of giving compressed yeast mixed with chaff or hay to milch cows and to fattening beasts, inform me that they think highly of the feeding properties of dried yeast. I shall endeavour to gather further information on this subject, and hope at a future occasion to communicate the results of my inquiries to the Society. Five or six alleged poisoning cases have been referred to me: but on examining the contents of the stomachs of the animals supposed to have been poisoned, I was unable to find any poisonous substance. In one instance I found the stomach of a pig, which was believed to have died from the effects of poison, greatly distended, and completely filled with the pods of broad beans, and some other vegetable refuse, and have no doubt that this mass of indigestible matter caused the death of the pig. It is a well-ascertained fact that food containing a large excess of indigestible vegetable fibre, when given to cattle or pigs too abundantly, seriously interferes with their well-being, and even may cause death. It is for this reason that ordinary cotton cake made from seed, from which the hard husks have not been removed, should be administered with caution. As the examination of stomachs for poison is a troublesome and time-consuming process, I may be allowed to suggest to members of the Royal Agricultural Society to call in the assistance of the Veterinary Inspector, Professor Simonds, and to request him to ascertain whether there is sufficient evidence of poison having been administered to warrant the expense of a chemical investigation. Under the head of chemical investigations I may mention the titles of three contributions to the last number of the Journal.

1. On the Composition of two varieties of Kohl Rabi and Cattle Cabbage.
2. On the chemical properties of soils.
3. On the composition and nutritive properties of Mangel-wurp.

Also the heads of two papers, which will appear in the forthcoming volume of the Journal.

4. On the composition of the Yellow Lupine and the soil adapted to its cultivation.
5. On Norwegian Apatite, Spanish phosphorite, coprolites, rock guano, and other phosphatic materials at present used in England for manuring purposes.

In addition to the investigations the results of which are incorporated in these papers, I have carried out field experiments on Wheat, Barley, and Turnips. The results obtained will form the subject of future contributions to the Journal.

A special grant having been made by the Council for carrying out certain dairy investigations, I have at once taken up the subject, and beg to lay before the Chemical Committee a brief summary of my investigation:—

1. I have completed a large number of analyses of different kinds of cheese. These analyses have brought to light several interesting particulars, on which I shall report in due time.
2. Many analyses of milk and whey have been made during the past six months.
3. I have spent 14 days in visiting eight dairies in Wilts, Gloucestershire, and Staffordshire.
4. With the assistance of several intelligent practical men I have carried out dairy experiments on a large scale.

- a. One series of experiments was undertaken with a view of ascertaining the exact amount of loss in casein and butter which is alleged to occur when milk is made into cheese.
- b. Another series of experiments had for its objects to determine the advantages of different plans of converting milk into marketable produce.
 - I. The whole milk of a large dairy was made into cheese.
 - II. Morning and evening milk was skimmed, and then made into skimmed-milk cheese, and the whole of the cream made into butter.
 - III. The evening milk was skimmed and added to the new milk of next morning, and then made into cheese.
 - IV. The cream of the evening milk was added to the new milk of next morning, and made into extra rich cheese.

These experiments were repeated, and eight large Cheddar cheeses made, which, when sufficiently ripened, will be submitted to a cheesefactor to determine their respective prices.

- c. Experiments were made to ascertain the loss in weight which cheeses sustain on keeping.
- d. Experiments also were instituted for the purpose of

tracing if possible the chemical changes which cheese undergoes in ripening.

The results already obtained are highly interesting and encouraging; but they cannot be well detailed in a short report, and will be incorporated in a paper which I hope to contribute to the August Number of the Journal. In conclusion, I would suggest to the Chemical Committee to direct me to confine my attention more especially to the dairy investigations; to continue the field experiments of former years, and if time permit to investigate the chemical composition and nutritive value of the different kinds of straw.—*Augustus Veleker, Royal Agricultural College, Cirencester, Feb. 1861.*

Letters were read on the prevention of the potato disease, of which the following is the most practical and interesting:—

"As soon as I perceive the leaves of my potatoes to be tainted, I immediately cover them entirely with earth, leaving the roots high and dry, the ridges being not less than 30 inches apart. The consequence is, that every tuber remains perfectly sound, without spot or blemish. I do not pretend to explain the cause of this, which probably may arise from the exclusion of atmospheric influence, as well as moisture; all I beg to draw attention to is the effect. I am at present digging as fine and as healthy potatoes as I ever grew, whilst a considerable portion of some which were sown only a few feet distant, but not earthed up, I found to be decayed and useless. This mode of treatment is equally applicable to every variety of potato and every description of soil. I have tried the experiment in fields as well as in gardens, and with the same invariable result. In 1856, having to plant two acres of potatoes in a stiff clay soil in Norfolk, I had them ploughed in with a common plough carrying 10 inches to the furrow, leaving the rows 30 inches apart. This was done the third week in March. After the potatoes were well up, they were hand-hoed, and kept clean until the beginning of June, when they were all earthed-up with a doubled-breasted plough; and in the middle of July 'Howard's patent plough' was used to take a single furrow from between each row, laying the furrow-slice on the top of the rows. In order to test the efficacy of the method, I left some of each variety of the potatoes uncovered by the earth. On taking the crop up in October I found every tuber of those which had been covered in the way I have described quite healthy and sound, whilst the half of those which had not been earthed up were diseased and entirely useless, thus showing that the potatoes only partially covered were affected by the disease, whilst those entirely covered, and, as I said before, lying high and dry, remained untouched.

"DIRECTIONS.—The potatoes, as I have said before, should be planted 30 inches apart from row to row, and 6 inches from set to set in the rows, and be earthed up in the usual way; nothing further is required until the first appearance of the disease in the haulm, when the tops of the potatoes must be laid on one side of the ridge, and then with a spade take six inches in depth of soil from betwixt the ridges and place it on the plants laid down, and so go on ridge by ridge until the whole are completed; by which means there will be a trench between each row of potatoes 6 inches below the tubers, which will be left high, dry, and perfectly sound, all moisture being carried off. As to the expense, which some persons have stated would be greater than the gain by this plan, I think it right to mention that the extra labour would be about 2d. per perch, or Devonshire yard. It has been already stated that the plan is equally applicable to the farm as the garden, the only difference is that one is done by manual labour, and the other by horse labour, which any good ploughman can do with a little practice; the first earthing-up with a doubled-breasted plough, the second with a single-breasted one; laying the furrow, which is taken from betwixt the ridges, on the top of the ridge of potatoes; hereby there would be a saving of expense, as a man with a plough and pair of horses would be able to do two acres a day. I hope the plan I have found invariably to answer will be generally tried another season, as I am confident a great saving would thereby be effected in the food of millions!"—*Leonard Short, Gardener to John Mildford, Esq., Coover, Exeter.*

A pamphlet, and the first ten of a series of original plans issued by the Cottage Improvement Society, were laid on the table, for which thanks were ordered.

The Council then adjourned to its Weekly Meeting on the 27th inst.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

STANDING COMMITTEES FOR 1861.

FINANCE.

Hood, Hon. Col. Nelson	Hobbs, Wm. Fisher
Vernon, Hon. A.	Howard, James
Barnett, Charles	Torr, William
Bramston, T. W., M.P.	

HOUSE.

The President	Shelley, Sir J. V., Bt., M.P.
Chairman of Finance Committee	Brandreth, Humphrey
Cavendish, Hon. W. G., M.P.	Challoner, Colonel
Hood, Hon. Col. Nelson	Gibbs, B. T. Brandreth
	Hobbs, Wm. Fisher

JOURNAL.

Portman, Lord	Johnstone, Sir J. V. B., Bt., M.P.
Speaker, The Rt. Hon. The	M.P.
Shelley, Sir J. V., Bt., M.P.	Acland, T. Dyke
Northcote, Sir Stafford, Bt., M.P.	Milward, Richard
	Thompson, H. S., M.P.
	Hoskyns, C. Wren

CHEMICAL.

Speaker, The Rt. Hon. The	Hoskyns, C. Wren
Vernon, Hon. A.	Hudson, John
Johnstone, Sir J. V. B., Bt., M.P.	Huxtable, Rev. A.
Miles, Sir Wm., Bt., M.P.	Laves, J. B.
Acland, T. Dyke	Sheridan, R. B., M.P.
Daubeny Dr.	Thompson, H. S., M.P.

VETERINARY.

Speaker, The Rt. Hon. The	Challoner, Colonel
Shelley, Sir J. V., Bt., M.P.	Gibbs, B. T. Brandreth
Johnstone, Sir J. V. B., Bt., M.P.	Hamond, Anthony
Miles, Sir Wm., Bt., M.P.	Hobbs, Wm. Fisher
Barker, Thos. Raymond	Simonds, Professor
Brandreth, Humphrey	Spooner, Professor
	Thompson, H. S., M.P.

STOCK-PRIZES.

Portman, Lord	Jonas, Samuel
Walsingham, Lord	Milward, Richard
Shelley, Sir J. V., Bt., M.P.	Pain, Thomas
Hood, Hon. Col. Nelson	Pope, Edward
Barnett, Charles	Smith, Robert
Barthropp, Nathaniel G.	Simonds, Professor
Druce, Joseph	Torr, William
Gibbs, B. T. Brandreth	Towneley, Lieut. Col.
Hobbs, Wm. Fisher	Turner, George
Hudson, John	Webb, Jonas

IMPLEMENT.

Portman, Lord	Exall, William
Speaker, The Rt. Hon. The	Gibbs, B. T. Brandreth
Cavendish, Hon. W. G., M.P.	Hamond, Anthony
Hood, Hon. Col. Nelson	Howard, James
Vernon, Hon. A.	Hobbs, Wm. Fisher
Shelley, Sir J. V., Bt., M.P.	Hoskyns, C. Wren
Miles, Sir Wm., Bt., M.P.	Shuttleworth, Joseph
Amos, C. E.	Thompson, H. S., M.P.
Barnett, Charles	Torr, William
Brandreth, Humphrey	Towneley, Lieut. Col.
Caldwell, H. B.	Wallis, Owen
Challoner, Colonel	Wilson, Professor

METROPOLITAN SITES.

Portman, Lord	Brandreth, Humphrey
Feversham, Lord	Challoner, Colonel
Walsingham, Lord	Gibbs, B. T., Brandreth
Speaker, The Rt. Hon. The	Hobbs, Wm. Fisher
Johnstone, Sir J. V. B., Bt., M.P.	Hoskyns, C. Wren
Shelley, Sir J. V., Bt., M.P.	Jonas, Samuel
Hood, Hon. Col. Nelson	Milward, Richard
Barnett, Charles	Thompson, H. S., M.P.
	Torr, William

GENERAL LEEDS.

Walsingham, Lord, Chairman	Hood, Hon. Col. Nelson	Beckett, W., M.P.	Humberston, P. S., M.P.
Malborough, Duke of	Johnstone, Sir J. V. B., Bt., M.P.	Beecroft, G. T., M.P.	Leeds, Mayor of
Macclesfield, Earl of		Challoner, Colonel	Milward, Richard
Powis, Earl of	Miles, Sir Wm., Bt., M.P.	Dent, J. Dent, M.P.	Pain, Thomas
Leigh, Lord	Acland, T. Dyke	Eddison, Edward	Salt, Titus, M.P.
Portman, Lord	Baines, Edward, M.P.	Gibbs, B. T. Brandreth	Thompson, H. S., M.P.
Tredegar, Lord	Barker, Thomas Raymond	Hobbs, Wm. Fisher	Torr, William
Cavendish, Hon. W. G., M.P.	Barnett, Charles	Hoskyns, C. Wren	

The President, Trustees, and Vice-Presidents are Members *ex-officio* of all Committees.

“THE ROT” AND THE REMEDY.

There has been now raging for some months past in the West of England a disease amongst sheep that is known as “the coathie” in Devonshire, as “the coa” alike in Devon and Somerset, or more significantly in some parts of the latter county as “the bane.” The epidemic will be perhaps better understood by the majority of our readers as “the rot.” So virulent has this been, so widely has it continued to spread, that hundreds of thousands of sheep have either died from the effects of the attacks, or have been killed as they sickened. In this extremity, application was made to the Royal Agricultural Society, and Professor Simonds was sent down so far back as the week of the Smithfield Club Cattle Show. No better step could have been determined upon, and many no doubt have anxiously awaited the result of the Professor's researches. This was given at the last Weekly Council Meeting of the Society, when the Report from the Veterinary College was read, and in which the following important passage occurs:—“Among sheep, at the early part of the year, chronic diseases of the lungs, resulting from the existence of worms (filariæ) within the bronchial tubes during the preceding autumn, proved very destructive. No doubt but the fatality of this disease was greatly added to by the long-continued wet weather and low temperature which prevailed. It is, however, to be feared that these same causes have had even a far greater injurious effect on the health of sheep in producing that fatal malady which is commonly known by the name of ‘rot.’ At the present time this destructive disease is wider spread than has been the case for many years; and in several of the western counties it is to be feared from the recent investigations of the Professor of Cattle Pathology, that whole flocks will be sacrificed to its ravages. Little can now be done to prevent these losses, the malady being one which has had its origin in the entrance of entozoa into the organism of the sheep, and during the preceding summer months. In their more perfect form these entozoa are known by the names of flukes, and are found to be inhabiting the gall ducts of the liver, where they not only produce functional derangement of the organ, but early lay the foundation for irremediable structural changes. The study of the natural history of these creatures opens up the only chance of preventing their attacks, and thus to save the lives of our sheep; and it is gratifying to find

that investigations of this kind have long since been undertaken by the Professor of Cattle Pathology, and which are satisfactorily progressing.”

We gather from this, as we feared, that the disease is wider spread than was perhaps ever yet known, and that whole flocks will be sacrificed. But one looks, perhaps, for something a little more definite from the opportunities Professor Simonds had of inspecting the afflicted flocks; and we turn on to the Official Report of his visit to Bridgerule, in which it is thus written: “An investigation of the symptoms satisfied me that the disease was rot in its most malignant form, and the doubt referred to I found to have had its origin in a want of knowledge of even the most simple facts of the animal frame. As I found indications of the disease in all the animals to a greater or less extent, without reference to their age, and as many were ewes in lamb, I deemed it prudent to select on the different farms some for slaughtering, with a view to determine if the individual proprietors would be justified in keeping them a sufficient time to produce and rear their lambs. In every case I regret to say that such was the advanced state of the malady that I could not advise any other course being taken besides that of disposing of the animals at a low price as quickly as possible. Inquiries since made show the propriety of this course, and it will appear from a report and details of particulars furnished by Mr. Kingdon, and attached hereto, that where the recommendation was not acted on, the animals are being swept daily away by death. This parish forms no exception unfortunately to the existence of rot among the sheep. And it is a serious thing to contemplate the great amount of loss which the country as a whole will sustain from the disease. Few districts can be found perfectly free of the malady; but especially does it prevail on wet, cold, and undrained lands. Late investigations into the natural history of the entozoon—the liver fluke—on the presence of which in great numbers within the biliary ducts the disease depends, would cherish the hope that ere long preventive means may be adopted to limit their development, and thus save the lives of many of our sheep.”

Now what does all this amount to? Let us take the Report of the Governors of the Royal Veterinary College, and back it with the account of Mr. Simonds’

professional visit—and so we gather that they have got the rot down in Devonshire, and they do not know what to do with it! Although we are to cherish a hope that ere long preventive means may be adopted, a hope that many have most probably been cherishing for some time past. Strange as it may sound, Lord Berners, who happened to be present, expressed himself as not quite satisfied with either of these Reports; or as the official circular sent us says, “an interesting conversation ensued, in which information was sought as to the origin and cure for this prevalent disease.” Strange as it may sound, we repeat, the meeting was not satisfied with what was “so satisfactorily progressing.” It would have been strange indeed if they had. The Report from the Veterinary College is, in a word, simply deplorable. It is merely an effort to say nothing in as many words as possible—a kind of routine royal speech that shall offend nobody and enlighten nobody. It was “explained” in the room that it was intended to be “general,” or to say little that any one could attack or contradict. If this be so, if the Report was framed with this object in view, it would really appear that the Governors of the Veterinary College had but little confidence in their own acts and deeds. At such a time, they had nothing better to offer the agriculturists of England than the roundabout common-places we have quoted; or the important fact that under certain conventional conditions a pupil had been awarded a silver medal for his study of the horse’s eye! Professor Simonds’ own return is worth but little more. It is only astonishing to find that a man, so educated to his subject, could have so little to say about what he had specially been to see. He may be keeping something back to mature; but Lord Berners would not be satisfied; he pressed his point. He wanted more information there and then; and in the end Professor Simonds made an extempore speech that was worth a hundred of the studied, elaborate, know-nothing Reports he was more or less committed to. Unfortunately, however, the press is not admitted to these meetings, and while these sonorous Reports are given in full, the speech is given in brief. The wants and losses and complaints of such men as Lord Berners, Sir Edward Kerrison, Mr. Slaney, and Mr. Dent, as we are told, furnished “an interesting conversation”;

and the Professor’s really valuable answer to these is cut down to a few dry sentences, furnishing the feeblest of echoes to what was said for the benefit of an open meeting of eleven members. We wish in no way to blame Mr. Hall Dare. It is not, and never should be the business of a secretary to supply such reports. We say nothing against the editor, who may be jealously preserving everything valuable, as editors will, for his own pages. But what are the Council to say to the agriculturists of England at such a crisis? What becomes of information that the grievances and questionings of one or two practical men eventually elicit? In plain truth, it is lost—unless Lord Berners and Sir Edward Kerrison and Mr. Slaney will each of them take to himself a district of Devon and Somerset, and deliver the Professor’s speech over again, so far as they remember it, for the benefit of those who are suffering so much, but who know so little of what they should do. To demonstrate the way in which this absurd spirit is working, one gentleman gravely proposed that the Report from the Veterinary College should not be supplied to the newspapers until it had first appeared in the *Society’s Journal*; that is, most likely, somewhere about September or October next, while “the disease is still spreading, and whole flocks are being sacrificed.” So far as this particular Report is concerned, we are afraid the world will say with us that the worthy gentleman and his *Journal* are welcome to it.

Nearly all we gather from the summary of what Mr. Simonds said is this: “It was not to be supposed that flukes originated in the coarse grasses of wet meadows, which grasses might be got rid of by efficient drainage, but rather that the plants were indications of dangerous spots;”—that “salt may prevent this development of the entozoa in the stomachs of sheep, as it is well known they do not become rotten on salt marshes;”—and that “turpentine is of value in leading to the expulsion of flukes, and is one of our most valuable anthelmintics.” Let us add to these one fact that the Professor does not mention, a suggestive one in these days of high feeding and breeding. None of the sheep bred and kept on the hill have been attacked. The hardy native sorts still resist the disease; and, so far we believe, there has not been a sheep lost upon Exmoor.

CHANGE OF SEED.

UTILITY OF CHANGE OF PLACE, AND CHANGE OF AIR AND SOIL, TO ORGANIC LIFE.

SIR,—Last autumn I attempted, through your journal, to point out the advantage of healthy seed and change of seed—that is, change of place. As the sowing season is again at hand, I continue the subject a little further.

The skilful farmer is aware of the utility of change from a different soil, and from some distance, if the distance is not too great in latitude, and a character of climatic fitness built up in the plant unsuited to the change of climate. That change, if not too wide, gives a stimulus to the *vis vite*, and is corrective of any locally-produced de-

fect. He also knows the importance of having his seed constitutionally healthy and strong, not cramped in its development by bad soil—soil defective in some of the requisite mineral constituents of the plant, or abounding in hurtful substances, or injured by frost while in an unripe, moist state, or by damp, heating, mouldiness, or animalcule-germs of disease. Still, there are some facts and inferences connected with the subject of reproduction, to which the writer has been led by a long experience, which it may be useful to state.

In the case of seeds *proper*, attention to change of place and healthy condition of parentage is of great importance; yet defects here are not so communicable as in the case of the continuation of life by cuttings of any kind—by tubers, slips, grafts. A plant raised from the seed is, so far, a new individual, often considerably different in variety; in vegetables frequently, and in animals nearly always, of mixed parentage: while in the continuation of life (as in the potato) by tubers, there is little or no change—no renovation, no admixture of parents, to correct defect in a particular direction—only a sort of ripening of the tuber to larger size and a greater abundance of pollen, leading, it would seem, eventually to a degeneracy liable to disease, and resembling old age.

In the case of potatoes continued by tubers, I never knew more than the above variation of the small seedling, from infancy to matured size, and apparently to infirm old age. The finest variety of the potato ever known—the “Holländische,” which some sixteen years ago was throughout Germany almost in universal use as a table potato, is now, I believe, extinct. All of those I brought over to Scotland were killed the first season's planting by the disease. The Perthshire reds, perhaps the next most delicious variety, have shared nearly the same fate. It is a general rule that the most delicious varieties of our tubers and fruits have the juices of the stem and leaves partaking of the same quality, and are in consequence more liable to animalcular attack, or infectious or putrid disease, than those of harsher juices: those of mildest taste, being farthest removed from the natural hardy species reared under the law of competitive selection, are the first that suffer. In the case of fruit, I have known a number of instances of change of character take place in life continued by grafting, the change occurring in one branch of the tree near the top (the trees had been grafted low down near the ground), but without being able to discover the cause. I have continued one of these new varieties by grafting.

Viewing the injury done to the cereal seeds and potato tubers in England by the past very unpropitious season, and that the cereals and potatoes in the greatest part of Scotland, where a better season and fine autumn brought the seeds and tubers to a healthy perfecting, secured in good order in the stack-yard and potato-bin, it would be wise for the English farmer to procure seed of both from Scotland. The central counties of Scotland, the Carse of Gowrie, Strathmore, and Fife, have excellent oats and potatoes of many of the most healthy and productive varieties, the potatoes free from rot, and are able to supply a great part of England with good quality of seed. The railways to the south, where the conveyance for several hundred miles will not be much above one pound per ton, and by sea only half as much, gives every convenience of transport. Scotland has always been famed for oats as well as men. When the Scotchman took the field as a soldier in former times, his provision was his bag of oatmeal, ready at all times, with water or milk, to form a nutritious and healthy food, and stood his ground pretty well with this nutriment, claymore in hand, against all assailants. Next to oats, rye appears to be the most nutritious and wholesome cereal: wheat, barley, and rice come next in succession. In no part of Europe have I found oats equal in quality to those of Scotland, and carried to the south of England the quality continues its pre-eminence for several sowings.

In Germany I have followed the practice of greening the potatoes for seed, which I had seen practised in England fifty years ago. In the autumn, when taken up, I laid them upon a dry exposed knoll, one potato thick, for some two weeks, covering at night with mats if it threatened frost. In being thus exposed, they were a little shrivelled as well as greened. One day I laid out a quantity new taken from the ground, alongside of what had been laid out ten days

before. The night following turned out unexpectedly a little frosty, and the potatoes having no cover, the whole laid out the night before were soft next day when thawed, while not one of those that had lain for ten days was injured. The reason wherefore the frost did not affect those greened seemed to be complex. From being a little withered, the cells of the tuber not quite distended with fluid, the contained fluid in freezing and enlarging did not burst the cells and destroy the organization of the tuber, whilst it might be that the concentrated fluids were more difficult to freeze. Life was also stronger in the greened tuber: it would breathe more, and might thus generate as much heat as would prevent the complete freezing, or the temperature might be kept a little higher by the increased strength of the unknown vital forces. From the blight being at that time unknown, I had not an example whether the produce of the greened withered seed withstood the disease better than what was not so treated. I only knew that the greened braided sooner and grew better than the ungreened. This leads me to notice a means of preventing the blight, stated in a late number of the *Gardener's Chronicle*, said to have been discovered by chance in Russia. A quantity of potatoes, very much withered from being left lying thin on a floor and forgotten, in consequence of the allotted seed running out, were taken to plant out the remainder of a field, although they were so much withered, that it seemed folly to plant them. They, however, grew, and the disease setting in severely, this remainder of the field escaped, while the rest were all blighted. Much dependence is not to be placed upon this one fact, as the exemption might be due to other causes; but the account further states, that the drying of the seed process has been followed in that country with marked success as prevention of blight.

The blight in the dry countries of the Continent, except in low damp river-silt land, or very moist weather, acts differently from what it does in Britain. In general the blight only affects the leaves and stem, sometimes only the leaves, the stem acquiring leaves a second time, the root and tubers remaining comparatively sound; but owing to the early destruction or injury of the portion above ground, the tubers only reaching about one-half their natural size. This difference from the progress of the rot in Britain is seen to be merely an affair of moisture. In travelling over a considerable portion of the Continent I have found, that wherever rain had fallen * at a certain stage of the potato's growth, the blight had made rapid progress, while those in the dry portion of the country remained untouched. But the rain not entering the very dry ground more than an inch in most places, only the moistened portion of the plant was affected to rottenness, the tubers remaining, as I have said, comparatively sound, though only half the usual size, little or no increase taking place after the destruction of the leaves. In regard to this seed drying prevention in the dry climate of Russia, where in many places the rain-fall for the whole year is little more than 12 inches, the dryness of the planted tuber may induce a drier firmer texture of stem and leaves, which may repel the blight; but it may not hold in the moist climate of Britain, yet it is worth trial. In the dry countries I have noticed that plants of the same species have quite a different look from those in the moister portions of Britain and of Ireland. In the latter the plants seem almost to be water spectra—solidified green water, similar in some degree to the loaves of our artistic bakers, who are said to be so expert, as with a slight powdering of flour to solidify white water.

Gowdie-hill, Errol, Carse of
Gowrie, Feb. 21.

PATRICK MATTHEW.

* In the dry countries of the Continent, in Summer, rain is generally caused or accompanied by thunder, and much developed electricity, with sultry atmosphere. The developed electricity has a loosening power upon the vital attractions of living organic matter, as well as upon dead organic matter; and supposing that the potato blight and other infectious diseases are vital—minutely animalcular, the developed electricity seems to cook the substance of the larger organism—that it loosens the vital attractions, so as to render it more palatable and permeable food to the animalcules of the disease; or in case of the disease being merely chemical, disposes the organism to be chemically affected by the touch of the chemical disease.

THE HERDS OF GREAT BRITAIN.

CHAPTER XXIV.

MR. JONATHAN PEEL'S HERD.

Burnley was at its old water-spout gambols, and had just succeeded in turning the whole of its cattle show-yard into a morass, when we fled from it Clitheroe-wards, into the hill country, and found ourselves ere night-fall at Knowlmer Manor, full eighteen miles away. Nature and civilization in the shape of fell and meadow have long waged a fierce strife for the sovereignty of this spot, but twelve years ago Mr. Peel threw a handsome Tudor house into the scale of the latter, and forced Nature to fall back upon her foxes, her grouse, and, we may almost add, her Lonks. The valley of the Hodder is one of the last places in which we should have expected to find such a substantial tabernacle, and we could almost fancy that some wandering band of free-masons had reared it in the days when Tudor or Plantagenet were living names, carved their quaint symbol as a memorial on the stone, and departed as silently as they came. To a lover of wild scenery, however, the choice is fully justified. Knowl Hill is on the right, with its cap of fir-trees, and in the distance the dark Staple Oak ridge crosses the valley of the Hodder, so dear to the Northern tourist, and looks down on the home of "Eastwood's Rosette," and the Towneley lot of yearlings and brood-mares at the Root Stud Farm. About 125 acres on millstone grit and heather make up Mr. Peel's sheep walk, and of the remaining 255 acres at the Home Farm, Harrowfield and Gibbs, about 50 acres are arable. The estate lies on the western edge of the Great Craven Fault, and the union of this limestone formation with the millstone grit on the hill side caused endless calculations and searchings of heart both to Mr. Peel and his stalwart bailiff, Henry Clapham, who originally acted as foreman of the drainers. Clapham came to the task with an hereditary knowledge of the subsoil difficulties, as his father held the farm for many years before under Mr. Peel's grandfather. Like the blast of Mr. Augustus Snodgrass's flute, you never knew exactly where you had it. Not only were no two fields alike, but there was no telling, from 30 inches to 10 feet, what depth you might have to go in each field. The layers of watery clay and gravel went up and down by an eccentric sliding-scale of Mother Earth's invention, which it would have puzzled even Mr. Peel's great Tamworth kinsman to define to the country gentlemen on the back benches; and when you got to drift clay, there was nothing for it but to stop entirely, and place the tiles thereon. Only one thing was certain—that the grit would be always above the limestone, and not directly in it; but there was no great comfort in that. A.D. 1844 saw the commencement of these fierce labours of spade and pick-axe, and although the land does not aspire to the glories of the Hodder side mea-

dows, which have been known to let as high as 7 gs. an acre, and feed off two sets of beasts and sheep in summer, it has already brought back its increase with compound interest, in the shape of swedes, orange ovals, cabbages, and kohl-rabi.

The "black mutton," as the Robin Hoods of the district delicately termed it, in the days of the "bold Buccleuch," has quite disappeared from the Forest of Bowland since the fiat of disparking went forth. Those who just remember the killing of the last buck, have long since grown into greybeards; and when antlers were extinct, the curved horn of the Lonk King reigned paramount on the fells. His prescriptive title among sheep may be traced back for more than a century, all round the Keighley Moors, Pendle Hill, and along the Forest of Bowland, to Lancaster. Nearer Rochdale, the farmers are wont to cross with the Saddleworths for the sake of greater size, and the blackfaced and sometimes a Leicester cross comes in on the lower lands near Lancaster, but the Lonk never nicks well with a Cheviot mate. Fastidious breeders consider that there is a separate breed of Lonk on every sheep walk, and discern the difference not in the shape, but in the darker or lighter shade of mottle on the face and legs. Quality of wool is of great Lonk attribute, and hence Mr. Peel has never crossed his flock with the Saddleworths, in spite of the temptation of the extra size both in fleece and mutton. Width of loin is the failing point, and by way of mending it and getting quality of flesh as well, Mr. Peel resorted to the Shropshire Down. The result, as compared with the cross of a Leicester and a pure Exmoor ewe, is rather remarkable. In the former case, the horn is knocked completely out of the gimmer lambs at the first cross, while it remains on the tups; and in the latter, as proved by the Devonshire men's experience, the horn is nearly always knocked out of both sexes. Mr. Peel's plan has been to cross out once, and then in again, but while he has thus succeeded in his original object, and obtained a finer general outline, he finds that it requires a second Lonk cross to get the wool (which has fetched 24s. per stone of 16lbs.), back to its original length of staple. The experiment, however, is not entirely satisfactory, and Mr. Peel is returning with all speed to "the old, pure, unmitigated Lonk."

The Knowlmer flock consists of about 120 ewes, and of these about forty or fifty are drafted every year, and brought down from the fell, to the valley, where they are put to a Leicester tup. The effect of their better fare is to bring many more doublets, and except the foot rot, for which the fell is an infallible specific, attacks them very badly, they are never moved back

again. Their lambs are sold fat in the summer, and the draft ewes are passed on in November to the Lancashire butchers, and average from 17lbs. to 19lbs. a quarter. Such is their peculiarly tameless nature, acquired from four "roving years," that they will not bear being taken up to feed.

It was not until 1851, seven years after Knowlmere had passed into Mr. Peel's possession, that he thought of buying a pure shorthorn. Like his neighbours, he merely kept common stock, and followed, on a small scale, the usual fashion of sending calving cows to Preston to supply the dairy, and heifers, steers, and drape cows to Scotland and elsewhere, to be fed off. The tenants of Col. Towneley, who owns several thousand acres in the neighbourhood, had especial advantages in point of blood; and, during his days of obscurity, the mighty Frederick dwelt at Colley Holme, near the source of the Hodder, and gave his fine mark to many a score of calves. None of them, however, had anything to do with the origin of Mr. Peel's herd, which began with Pearl by Tom Steele (8715), from Princess by Buchan Hero (3238), and two heifers which didn't breed. At this time he had no particular leaning towards any tribe; and, by way of a start, Baron Martin (14136) by Hector (8138) was purchased; and from him and Pearl sprang Young Pearl. Baron Martin won the maiden cattle show prize for Knowlmere, at Whalley, in 1854; and his brother was highly commended at the Carlisle Royal next year. Pearl had a calf afterwards to Towneley's Fritchbank (1298); but nearly everything of hers and Baron Martin's sort was swept off in the murrain of 1856, which was severe enough to make nine breeders out of ten throw up the task for ever. It raged without intermission from the October of that year up to the April of the next; and the Knowlmere homesteads became one great lazar-house. A common cow which was bought in for milk was supposed to have spread the taint; and in less than a month it had gone through nearly the whole herd. Still, in the height of its violence, it seemed to obey some subtle law; and, while it swept all the east side in one house, two Alderneys on the west side never suffered at all. Even when it attacked the first of a row, it did not go on in rotation, but generally singled out the heaviest milkers for its earliest victims. Crumbling of the lungs, which rendered it impossible to chew the cud, was its most prominent symptom; and although the lives of a few were prolonged by the adoption of Horsfall's plan of gruel and cod-liver oil three times a day, only two or three fought through, and were kept up, in apparently the last state of exhaustion, by iron and ether tonics. Old Pearl withstood all infection; and Pearley, by a Son of Major, who was born soon after, was the only one left of the race.

"Never say die" is a motto which has seldom brought grief to its utterer, and Mr. Peel, nothing daunted by the sight of his Shorthorn necropolis, acted right boldly up to it. He drew a cheque of 125 gs. for Mr. Bolden's ten months' bull calf the Duke of Moscow by Second Grand Duke, from Victory by

Third Duke of York; and in exactly four years from the time of his purchase, the news was flashed along the wires to him at Wiesbaden, that Malachite, the first of his own breeding that ever entered a show-yard, had defeated a field of twenty-seven yearling bulls at the Canterbury Royal. This bull and eight cows and heifers still remain to testify to "Moscow," who was used for two or three seasons, and then came an infusion of Booth blood, with Valasco (15443). An exchange was made for a time with Mr. Carr, between him and Prince Oscar, and after a short second stay he was succeeded by The Monk (11824).

Ruby by Red Rover (11982), and Strawberry by Frederick (11489) from Sprightly by Belshazzar (1703), were bought at Mr. Smyth Owen's sale, to cross with the Duke of Moscow. Mr. Culshaw arrived just too late to bid for Strawberry, and as in the absence of a vigorous competition she came to Knowlmere for 60 gs., her loss was not so severely felt when she died in milk fever, after producing a bull calf. Ruby is still the eleven-year-old matron of the herd, and Rowena by Duke of Moscow, and Rebecca by Valasco, preserve her line in female tail, at Knowlmere, from which her Candidate and Muscovite have departed. Lally, the dam of McTurk (14872), and his own sister Laurel, (for which Mr. Drewry gave 50 gs. on behalf of The Duke of Devonshire at a fortnight old) was another special purchase to bring out "Moscow," and she proved well worth her 86 gs., although her bull-calf by him died. Mr. Cator's herd furnished Constance by Selim (6654), her half-sister Queen of Hearts, by Norfolk (9442), and Duchess of Norfolk, with an escutcheon, which goes right back into Medora and Sister to Isabella. Darlington 4th, of Bates's Percy blood, was sold when in calf by The Duke of Moscow to Mr. Atherton, of Speke, in exchange for Usurpation, and Roan Cherry, with a "consideration." Cowslip 5th, of Bates's Chieftain and Cowslip 2nd descent, was another Speke contribution. She calved Cherry Lips, by Cherry Duke 2nd, scarcely an hour before her purchase; and her half-sister Nelly O'Brien from Lily 2nd, a combination of Fourth Duke of York and Second Duke of Oxford, was passed on by Mr. Atherton soon after he bought her from Mr. Peel, for 150 gs., to the Australians. Naomi did not breed, and now that Garibaldi has departed to seek his fortunes at Middleton Hall, Pendant is the only representative of Pearley, by Son of Major (11769). If Mr. Peel has inclined latterly to Booth's bulls, he has gone in with equal spirit for Grand Duke females. Among his purchases from Mr. Bolden are Czarina, with two Grand Duke crosses, and the dam of Czarovitz, by the Third of that Thousand Guinea line. Bountiful, who came with her, has also two Grand Duke crosses upon Baron Warlab and Leonard, &c., and the white Bride by Second Duke of Bolton (12739), from Bridecake by Crown Prince (10087), makes up the Lancaster trio.

The sight of old Black Jet, with her Aughton Hero foal, which had been highly commended at Burnley the day before, served as a little interlude between the past and the future, as we walked across the meadow to view

the herd. Few masters can boast of so good a servant, and her own prize-taking career, which she inaugurated the day that Mr. Peel purchased her at Clitheroe, has been closely copied by her progeny. Her three-year-old, which has won seven firsts already, was purchased by Mr. J. B. Booth at Canterbury, and the four-year-old has been nearly as lucky. Thanks to her, horse prizes have become rather a Knowlmere specialty, and this pair were among the five which won five firsts for it at Blackburn in '59. Her two-year-old daughter, whom we met with later in the day, did not share the recent Burnley triumphs of the seventeen year-old Jessie, as a leg twist in a gate has driven her out of the North Lancashire show-yards, for a year at least. Salmon, as well as cart-horses and calves, have also had their turn in the park, and a stream as pure as crystal, from between the limestone and the grit, was trickling down the now deserted beds, in which the *ova* boxes were deposited for hatching. The stream ran over the young fry for twenty-one days; at the end of which they were removed to the first pond; the second became their local habitation when they were yearlings, and they then took their start for life as two-year-olds in the river. It was here that Mr. Ramsbottom, who has been to salmon what Nesfield is to landscape gardening, acquired much of the experience which he has brought to bear in Ireland, Scotland, and Hungary, and solved the much-vexed question to his entire satisfaction, as to whether "smolt" are the salmon fry of the year before, or the year before that. Of the merits of the controversy we know nothing; but those who feel dull when they are waiting for the train at Clitheroe, and yearn to know what a young "cock-salmon" looks like when it emerges from the egg, and is magnified 64 diameters, had better stroll up street and look into his shop window for some minutes as zealously as we did.

Usurpation, a cow with a nice forehead and well-formed rib, but rather large hips, by Usurper (13929), from Princess Alice, an 105-guinea purchase at the Aynhoe sale, crossed the drive at this moment, and recalled our thoughts to shorthorns once more. She was heavy in calf at the time to Valasco; and since then the young white bull *Morisco* has been gazetted with Mr. Strafford. Her Speke mate Roan Cherry made a curious end. She was considered hopeless as a breeder after the birth of Baroness Cherry, as, although she seemed blooming, she showed no sign of coming in season, and the discharge was accounted for, at the end of twelve months, by the butcher's discovery of a skeleton twin. A common cow, which was shortly to act as nurse for Bridesmaid, separated her from *Lally*, the first that Mr. Grundy ever bred. This red daughter of Earl Derby (10177) has all the peculiar setting on of his neck and head, and a nice deep forehead; but she falls slightly away in the loins, and is rather dark in the horn. Her last calf was Earl of Oxford, by Gunter's Sixth Duke of Oxford (12765), but it died of diarrhoea, and she is now due to calve in a few days to Malachite. In point of age, *Bountiful* has nearly a six years' pull over her, and the high-bred fusion of blood in her veins has "eventuated" not exactly "a spanker," but in a

nice compact, hardy-looking cow, a little thick in the jowl, and slightly inclined to be rumpy. *Czarina*, who in emulation of *Pearley*, had left her tail in a thorn bush, had very nice quality, but no very remarkable character, and from her style of head and manner of holding it, we should have taken her at first for a John o' Groat. *Waterwitch* of Royal Buck, Hopewell, and Hamlet descent, and a very squarey-made cow with nice short legs, and hocks well under her, was bestowing a loving salute on her *Waterfay*, by Valasco. We found this calf along with her roan half-brother *Sultan*, from *Czarina*, in a heather shed (where Malachite spent his calf-hood), on the other side of a small tributary stream to the Hodder, which runs right through the Park. The white was rather the robust-looking of the two, while *Sultan*, who had more elegance and a very capital coat, showed a trifle more tendency to be on leg.

Gibbs's farm was our next point; and the body sheets which hung on the wall to dry, and the blue van with the red wheels drawn up on the knoll, and still thick with the dirt of a weary twenty-miles' drag across the hills, with Malachite and Bounteous from Burnley, the night before, told the proximity of "the training ground." The workmen were busy at a new bull-and-calf house, and a twelve-inch vortex turbine, which has just been put up to turn a saw, bruising, and agricultural purpose mill, is an earnest that its owner does not intend to shrink from doing battle in future. So far, in addition to his Royal victory, *Malachite* has four firsts on his list, to wit, at the North Lancashire (where he met Col. Towneley's Broadback and Priam), the Manchester and Liverpool, the Craven, and the Wetherby; but Mr. Fawkes had his revenge upon him with *Gardoni* at Pontefract. Although not a very striking bull to the eye, he has the merit of fine length without weakness; his richness of hair was well served at the Royal, and he is level and neat in his hips. When he had returned to his place, *Bounteous* and *Lalage* took up their stations side by side. The latter has nearly five months' advantage in age, and is a little nearer the ground, but on not quite so nice a leg; and although she has a much better breast, she loses all the advantage when you look at her from behind. *Bounteous*, of the triple Grand Duke crosses, is of a lighter red, and has a sweeter and cleaner head; but her neck is a trifle too cresty, and this rather detracts from her otherwise beautiful character. She had been a little punished with her trip to Burnley, where she was beaten by Frederick's Granddaughter; but still she did high credit to the Grand Duchy. Mr. Peel's Lonk ram, "Mountain King," who had won his thirteenth first-prize at the same show, stood waiting for us as we turned from this pair. He made quite a picture as he stood, held by a rod through holes drilled in his horns, and with a fleece of 16lbs. on his back, of which fully 10lbs. had been made since the 6th of May. Through the heart and in the breast he was all that could be wished, and the family failing of the Lonks over the loin was very small indeed. So far he has never known a defeat, and even the staunchest Herdwickites

would hardly wag his tongue against him. When his *levée* was over, we retraced our steps to the Home Park once more, and crossing a suspension hand-bridge of 116 feet, we came first on *Cherry Lips* by 2nd Cherry Duke. She is a half-sister to Malachite, with no great gaiety, but a capital middle. Of *Mabel* and *Mayfly*, two Moscow sisters, we liked the younger the best, and she was long, low, and pretty, but with rather a droop in the loin. *Baroness Cherry*, a twin of Baron Bickerstaffe from Roan Cherry, was well haired and snug, but, on the whole, we thought less of her as we got nearer to her. The white *Pearley* had a good rib and forequarter, and in the former point especially her daughter *Pendant* resembled her.

The Home Farm buildings gave us more scope; and the white *Bride*, with her little white *Bridesmaid* by Valasco at her foot, were duly in waiting to receive us. *Bride* has quite lost all those restless habits which she had at Mr. Bolden's, where, in consequence of being petted so early, she would never stop with the herd, but kept lowing all day her desire for recognition, as near the house as she could get. Change of scene has had its due influence; and, to use Clapham's phrase, she has now become quite "doesome." She has rather a Roman nose, which gives her fine character; and her good shoulders, short leg, and absence of false rib, help to carry out what you gather at the first glance—that she is a cow of immense constitution, and exceedingly like Mr. Saunders's favourite *Pearl 7th*. She lost her Third Grand Duke bull-calf; and the little *Bridesmaid* was only a fortnight old. The rest of the cows were clustering round the farther homestead (which, like all the others, is very nicely planned); and those who had

seen Malachite, could not fail to recognize his dam in *Cowslip 5th*, when she turned her head half round. Old *Ruby* was there, almost milked to a shadow. The pail is so much her *forte*, that her milk, when tested fourteen days after calving by a lactometer, was found quite equal to an Alderney's; and years do not seem to tell on the quantity. *Duchess of Norfolk* was a nice-looking cow with the same pail propensity, and could show *Gleam*, of a fortnight old, by Valasco; while her *Graceful*—a clever, level heifer, but a little drooping behind—had only just completed her eleven months. *Rebecca*, by Valasco, did Ruby no small credit by her wealth and substance; and *Catalpa*, by Valasco, with all the rich hair of her half-brother, might well be put to the credit side of *Cowslip 5th*. *Gondomar*, by Valasco from Bountiful, who has just been let to Mr. G. Garne, of Churchill Heath, bids fair to make up into a yearling of great frame; and his nurse-cow bore such a remarkable resemblance to Queen Mab about the head and neck, that, if a rug had been thrown over the rest of their limbs, no one, except Mr. Booth or Cuddy, could have safely taken his oath as to the identity. The *Monk* was in the sole occupation of the bull copy, after being pushed from his Aylesby sovereignty by his illustrious son, Dr. M'Hale. Some little black Highlanders came grazing up to the wall, as we were admiring those rare fore-quarters and "grand arched rib" on which all the Boothites are wont to dwell; and this quaint and unlooked-for contrast of the Blacknose and Whitenose nations gave us something more to muse on, as we turned our back on Knowlmere and its thirty-two, and strode up the valley towards Whitewell.

H. H. D.

ON THE COMPARATIVE FATTENING QUALITIES OF PURE AND CROSS-BRED SHEEP.

By JAMES B. BIRD, Fishwick, Berwickshire.

[Premium—The Gold Medal]

In experimenting with pure and cross-bred sheep with the view of ascertaining their comparative feeding and fattening qualities, the writer, on consideration, thought it would be most satisfactory to do so with animals verging on the age of maturity. Accordingly, twenty wethers—viz., five Leicesters, five Cheviots, five half-breds, and five twice-crossed, all in their second year—were selected for the purpose.

The Leicesters were purchased from a gentleman in the immediate neighbourhood, bred by himself as the purest blood; the Cheviots and half-breds from Mr. Murray, Long-yester, near Gifford, who breeds all his own stock, consequently they were out of the same flock of ewes; the half-breds being got by Leicester tups, also bred by Mr. Murray. The twice-crossed were bred and reared on the farms with which the writer was connected (the experiment being conducted during winter '58 and '59), being the produce of half-bred ewes and Leicester tups—the ewes themselves a cross betwixt the Leicester and Cheviot, the tups purchased as some of the best blood in the county.

The five Leicesters were purchased and brought on to the ground on the 21st, the Cheviots and half-breds previously, on the 15th October, 1858. All were retained on grass till the 28th, when they were folded on white turnips, on which the twice-crossed sheep had been for nearly a month before. On the 13th November all were correctly weighed, each lot of five, as described, being then put into separate enclosures, and treated exactly alike, as immediately to be detailed. When thus put up to feed, they, to appearance, seemed very much upon a par as to progressing healthy condition—all having thus a fair and impartial commencement.

The enclosures were formed against a stone fence, sheltering all the sheep equally well from the north-east, they being very well protected from blasts and stormy weather from other directions by hurdles and straw being fitted up together, so as to form for them a desirable and welcome retreat, which they not only used in such weather, but to which they very generally retired at night even in ordinary weather, the bedding of straw seemingly being to them an inducement in pre-

being topped and rooted, given to them whole in troughs, in which state they ate them easily and readily enough, only the Cheviots proved too nice to eat the crowns, as well as some of the inferior portions of the bulbs, and therefore it was thought advisable at once to resort to Gardiner's cutter. Cut swedes, then, of the very best quality, stored in good condition during favourable weather, formed their chief food from 13th November, when the trial commenced, till the 16th March, when it terminated, exclusive of a daily allowance of oats during the last five weeks. Great quantities of the straw, put in hurdles to afford them shelter, was used by them, which was again and again replaced, but no account kept of the amount that was consumed by each lot, it being thought an item of trifling consequence—all seemingly eating and relishing it equally well. Without a single exception, they were all also remarkably fond of the oats.

For the first eight weeks or so, the Leicesters, Cheviots, and half-breds fed as regularly as could be desired. The twice-crossed, too, although feeding regularly enough, seemed more easily satisfied at first, their appetite, however, gradually increasing towards the close of the experiment. For the last nine weeks the appetite of the Leicesters for turnips steadily declined, till, near the end, they scarcely used the one-half consumed by either of the other lots, though always very ready for their oats, and fond of eating straw. To the very last the Cheviots and half-breds preserved their appetite unimpaired. All were weighed correctly a second time on the 10th of January, 1859, and again, for the third and last time, on the 16th March, when the experiment terminated. The Cheviots and half-breds being sold, two or three days afterwards, to a butcher, at so much per pound dead weight of mutton, the writer saw them killed, dressed, and weighed himself, noting particularly the individual weight of each sheep, to see how it tallied with the live weight, according to a given rule amongst sheep and cattle dealers—viz., for every 14 stones of live weight of well-fed mutton, six must be deducted as offal. He at the same time saw, also for himself, the tallow of the two lots correctly weighed, an account of which is also given in the statement of result.

Each sheep at first having received its own distinguishing mark, the writer is thus enabled to show the exact weight gained by each during the time of the experiment.

At first sight, perhaps, the statement of result may appear incomplete, showing, as it only does, the comparative amount of weight gained by each lot during the time of the experiment, without its being calculated at so much per lb., and the comparative amount of profit or loss in money shown. Such, however, has been no overlook or neglect on the part of the writer. He has omitted doing so because he feels the difficulty exists as to what such gain in weight should really be calculated at. Doubtless the weight gained by sheep or cattle during the period of their feeding and fattening is not all in mutton or beef, but partly in offal; and regarding it only in this light, the writer at one time was of the opinion that a deduction ought to be made for such. Such opinion, however, has since been shaken by the consideration of the fact, that although the gain in weight during a period of feeding by a lean or half-fat animal must be regarded as what it in reality is, partly offal, the carcass, as a whole, becomes so much enhanced in quality during the same period, and by the same food, as not only to justify the whole amount of weight gained being calculated at full money-rates of market value without any deduction for offal, but even in some cases a little addition to such—such as when the stock fed and fattened are at the commencement particularly thin. Weighing the matter thus, and thinking that difference of opinion as to such might also

exist amongst others, he thinks better, as to this experiment, to leave practical men to calculate the amount of weight gained at what they think proper according to their own opinions, especially as a very definite conclusion may be arrived at, judging from the comparative gain of weight alone; the quantity of oats consumed by each lot being exactly the same, while not a great deal of difference is shown in the quantity of the turnips.

Allowing the result of the experiment on each sheep singly to speak for itself, and commenting on each lot of five as a whole, the writer would direct attention to No. 1, Leicesters, during the first 57 days' feeding, having consumed 708 square yards of turnips, and gained in weight 3 stones 9 lb.; to lot No. 2, twice-crossed, 606 square yards, and gained, after deducting 5½ lb. loss, 1 stone 9 lb.; to lot No. 3, Cheviots, 636 square yards, against an increase of 2 stones ½ lb., deducting 2 lb. of loss; and to lot No. 4, half-breds, 744 square yards, and gained 3 stones 12 lb. additional weight.

Although, as now shown, the turnips used by lots 2 and 3 were a little less in quantity during the 57 days' feeding than what were used by lots 1 and 4—consequently, calculating turnips, say about £7 per acre, a trifle less against them as to expense—the much smaller amount of weight gained in mutton will not allow them to stand a comparison with the latter Nos. 1 and 4, Leicesters and half-breds, which may, taking the very near equality in the amount of food consumed and increase in weight, be regarded as very near upon a par with each other.

At the termination of the last 65 days' feeding, lot No. 1, Leicesters, shows a very marked decrease in its consumption of turnips, 512 square yards only having been used; while the additional weight acquired was even comparatively smaller—just 6 lb.; lot No. 2, twice crossed, shows a consumption of 689 square yards for the increased weight of 5 stones 2 lb.; lot No. 3, Cheviot, 664 square yards, for 4 stones 7½ lb.; while lot No. 4, half-bred, in return for 673 square yards of turnips consumed, gives the very superior increase of 6 stones 12 lb. more weight; each lot consuming besides, 128 lb. oats.

For the whole 122 days' feeding the result exhibits, as to lot No. 1, Leicesters, an increase of weight of 4 stones 1 lb., against the consumption of 1,220 square yards of turnips; lot No. 2, twice crossed, 6 stones 11 lb., against 1,295 square yards; lot No. 3, Cheviots, 6 st. 8 lbs., against 1,300 square yards; and lot No. 4, half-bred, 10 stones 10 lb., for 1,417 square yards; No. 4 having thus gained in all nearly 4 stones more weight than either of the others, in return for little above 100 square yards more turnips consumed, which undoubtedly assigns the superiority to the half-breds in this experiment as to the comparative qualities of fattening and increase of weight.

It must, however, be borne in mind, that as the Leicesters, lot No. 1, did not eat so regularly and plentifully as they might have done—for several weeks before the close getting apparently discontented both with food and confinement, some of them, in consequence, even losing considerably in weight—the result of the last 65 days' feeding with them cannot be regarded as any conclusive comparative criterion to go by whatever, though the trial with them against the other breeds during the first 57 days may be viewed as a very fair one. The twice-crossed, lot No. 2, as gaining 3 lb. more weight during the full period of the experiment than lot No. 3, on a smaller quantity of turnips, must be owned as standing second to No. 4.

But the writer, while commenting impartially on all, thinks proper specially to call attention to the trial with the Cheviots and half-breds as being exceedingly satisfactory, and the one on which greatest reliance may be placed as of real practical

value—both lots being not only, on the mother's side, of the same blood, but bred and reared on the same ground, thus making them greatly more valuable as subjects for an experiment such as now detailed. It was this consideration which partly prompted the writer to carry out the experimental test with them to the latter, and see them killed and dressed himself, so that the correct weight of mutton and tallow, as well as the quality of the former, might be ascertained. And well did all of them kill: several slaughterers were assisting, and all expressed their admiration, especially at the hind legs of the Cheviots. "Such mutton," said they, "was rarely killed in Berwick." And although the mutton of the Cheviots was most admired, as being thought more likely, judging from the taste of the public at present, to find a ready sale; yet the half-breds, as to comparative weight in mutton, again proved their superiority by nearly 4 stones more than the latter, besides a few pounds more tallow. Taking it as a proportional question, according to the respective live weight of each, the Cheviots, had they killed as well as the half-breds, ought to have produced nearly one and a-half stones more mutton than they actually did. And yet, conclusive as this may seem, the writer cannot think but that it would require a series of like experiments made, ere judgment could be pronounced finally in favour of feeding half-bred sheep at all times, and in all circumstances, in preference to Cheviots. So much is due to what is termed "a difference of blood" in stock of all varieties, that although the experiment in this case has proved itself a very marked one in favour of the half-breds, in all probability, were a few more like experiments conducted with sheep selected from various flocks, some might result in favour of the Cheviot.

A difference, too, of food, soil, situation, or altitude, may each, separately or combined, be the means of causing anomalous and unexpected results in the feeding and fattening of different breeds of sheep stock especially. It is not invariably the best of food and shelter that will do if something else is wanting. Witness the result in this experiment as to the Leicesters. Cheviots are Cheviots wherever they may be met with, likewise Leicesters, and every other breed. Each and all, if pure, will present the same distinguishing features in their general tastes and habits, as well as appearance; and yet, strange to say, what is bred by one may be found not to feed and fatten so well, whoever gets them, as those bred by another. So much for a difference not of breed, but of blood, creating, as it visibly does in all species, a greater or less inherent propensity to grow, feed, and fatten—a propensity hereditary in its nature, and so transmitted from one generation to another. As already hinted at, climatic influences produced by soil, situation, or altitude, may, and in all probability do, exert a powerful effect, either salutary or deleterious, towards the feeding of the different breeds of sheep. Thus, results that were obtained, as in this experiment, on a dry soil, with plenty of shelter, at, by Government survey, an altitude of 500 feet, might have been very different on a poor, wet, exposed piece of moory land at an elevation of 700 or 800 feet; or again, on the deepest, richest soil, thoroughly sheltered, and at the height of 200 or 300 feet above the level of the sea.

Management, too, as most will allow, tends very much either to the successful or unsuccessful results in sheepfeeding. Thus, with advantages every way the same, one man may make more, or at least as much, of what is generally regarded as a secondary breed or class of sheep, than what some of his neighbours make of the most approved. This applies more especially to stock-feeding on the same farm on which they have been bred. So, possibly, a good deal may depend on the

farmer, farm, and stock having been for some time accustomed to each other. Thus, from a variety of unpropitious circumstances and unfavourable occurrences for a time clashing with each other, sheep of a certain breed may be found to succeed so badly as to prove almost unprofitable, but which, when persevered with, may turn out to be the very reverse, responding liberally to the most sanguine expectations.

Such being a very few ideas as to sheep culture—not indeed peculiar to the author, but prevalent, he is fully persuaded, amongst, and thoroughly appreciated by, the greatest proportion of those who have had experience in the breeding and feeding of sheep—the writer feels it would be unfair in him claiming especial attention to what he has termed "A Satisfactory Experiment as to the Comparative Feeding and Fattening Qualities of Cheviot and Half-bred Sheep," without stating fully everything, in his opinion, that may and does detract from its really practical value, and cause it to be doubtfully regarded and cautiously relied upon as being under all circumstances a sure basis on which to build sanguine expectations as to the remunerative results from any peculiar breed of sheep, compared with others, when annually and extensively put to the test in whole flocks feeding in the ordinary way in the field. A series of experiments, such as the one now reported, on different soils, &c., and subject to the opposing influences just noted, can alone give reliable results on which to ground an extensive practice, without the risk of loss and disappointment. The writer concludes, then, with the hope that others may begin where he has left off, and lend their assistance in throwing a little more light, in the shape of practical proof, on this department of agriculture—a department which is more and more every year proving itself to be, with all kinds of sheep, one of the most remunerative.—*Journal of Agriculture*.

NOTE.—These experiments are interesting and valuable so far as they go. If the same number of sheep, of the different breeds experimented upon, had been fed together in the open fields, and the weights of the individual sheep ascertained, some striking facts might have been elicited. When sheep are confined in pens or enclosures, they always, as in these experiments, progress very unequally. This we find to be invariably the case in feeding sheep in sheds. Being in a great measure necessitated to feed all our sheep in sheds at Kilwhiss, we have found that while some of the Cheviot breed would gain fully 2 lb. in live weight weekly for about six months, others in the same pen were comparatively stationary. In experiments on feeding it gives greater precision to results if the exact weights of turnips are given. At present our data are still somewhat imperfect for ascertaining and discussing the profit or loss arising from feeding stock on turnips.—ED. J. A.

TO RELIEVE CHOKED CATTLE.—Put upon the creature's head a rope or head halter, and draw the rope over the girth of the barn or some object which will raise the animal's nose as high as can be done while standing upon its feet. Then let two men take a smooth lever or sled stake, and standing one on each side of the animal, press it hard against the throat and carry it gradually down as far as possible, and the obstruction will be carried down into the stomach, and the creature is relieved. This method I have never known to fail, and it being an external application, is perfectly safe to both man and beast. Take a small quantity of powder, enough to load an old-fashioned musket, do it up in some soft paper like a cartridge, raise the animal's head, draw its tongue, put down the cartridge as low as you can, so that the creature will attempt to swallow. After a few minutes let it move about, and soon the creature will be relieved, and no damage be done to it in any way, which I have known done by the other remedy.—*Correspondence N. E. Farmer*.

A VISIT TO WOOLSTON.

Sir,—Seeing the general invitation of Mr. Smith I determined to accept it, that I might have an opportunity of judging of the merits of his system by an inspection of its effects on his own farm as well as its action. I had seen it in operation on the Flemish farm at Windsor in the autumn of '58, and felt anxious to see it at home.

Accordingly, on Monday last, accompanied by two friends, both, like myself, practical farmers, I went to Bletchley Station, and thence to the far-famed Woolston, passing across a wet backward country, on which the past season must have told very unfavourably for horse-labour. Indeed, the heavy rains that had lately fallen, and the nature of the land, made us far from sanguine that we should find the apparatus at work. However, we persevered through mist and rain, and on arriving at Mr. Smith's residence were greatly relieved to hear the steamer was industriously at work *digging carrots*. The field to which we were directed forms part of the Woolston *light land*; perhaps it may be called so by comparison, but it is widely different to my own *light land*; nor do I imagine my ploughmen would give it that appellation. Here we were welcomed by Mr. Smith; and, as the implement was stopping for a few minutes, that gentleman conducted us over some of the adjoining fields, the appearance of which bore ample testimony to the efficiency of his system of cultivation. The swedes were *magnificent for any season*, affording a striking contrast to the small poverty-stricken roots in my own and all other neighbourhoods I have visited during the present season; the absence of treading, added to the depth and completeness of the cultivation, having enabled them to develop themselves to a degree scarcely credible. We did not weigh any of the roots, but I should imagine 16 or 17 lbs. was a common weight for them: they had been grown in Mr. Smith's ordinary way on ridges one yard apart.

Crossing a meadow, we proceeded to a stubble-field in course of preparation for a fallow crop. The stubble had been first manured with a moderate coat of dung, then smashed by steam to a depth of 10 inches with the No. 3 Cultivator; the next process is to ridge it with four horses and an ordinary ridging plough in the opposite direction to the smashing, the ridges being one yard apart, in which state the land remains till seed-time, when the tops are hoed and drilled. The ridging plough had been one "bout," to show the effect; and no land could possibly lie "kinder" for the action of frost and weather, while the cleanliness of the field was remarkable.

Having seen thus much of the effects of the system, we returned to the apparatus now steadily at work digging carrots, which it accomplished by drawing a strong subsoil plough or iron tine between the rows, at a depth of 18 inches, heaving the land up to some distance on either side, and loosening the carrots so that they could easily be pulled by hand, or with the assistance of a spade, and at the same time subsoiling the land most effectually.

But it is time I turned to the implements and apparatus, which now come more especially under our observation.

Simplicity, portability, capability of adaptation to circumstances: such were the most important characteristics,

which, to my mind, appeared especially to belong to the system, and a further examination served only to deepen these impressions. Mr. Smith's apparatus is pre-eminently adapted for a practical farmer, and an ordinary average farm, whether we regard his engine, anchorage, or implements. The engine is an ordinary 8-horse power one, such as we use for our thrashing, and may be made by any maker, and used for any purpose, the only alteration required being, the addition of a rigger of 3 feet or 3 feet 6 inches diameter on the axle of the fly-wheel, so that when the work is heavy a slower speed may be obtained by shifting the strap; the anchors are simple, portable, and easily shifted in the ground, or transported from one field to another; the implements are strong, simple, inexpensive, and efficient; the windlass powerful, and, like the rest, simple.

I must here refer to a point of great importance to the practical farmer in deciding whose system to adopt out of the many competitors now in the field, viz., the comparative amount of locomotion rendered necessary in the *HEAVY machinery*.

All those in which the engine travels over the land with the cultivator bear about with them their own condemnation as far as the vast majority of farms are concerned, and he who attempts to employ them will, I fear, find his cultivator very much like the family group picture of the "Vicar of Wakefield"—admirable no doubt in itself, but a cumbersome nuisance, and a laughing-stock for his neighbours.

Fowler's ploughs avoid this danger to a great extent, but still there is the weighty engine to travel from end to end of each field, and the weighty anchor to be transported to the opposite headland, and then to travel step by step along that also. Let the heavy land and hill farmers think well over this before they prefer Fowler's to Smith's apparatus.

Once more let us turn to Mr. Smith's system, we shall see that the difficulties in the way of transporting the rope, anchor, rollers, &c., are trifling, the only really cumbersome portions being the engine and windlass; now *both* of these, instead of travelling over the land continually, are placed on a certain spot from which they will operate on 16 acres *without once requiring to be moved*. I say 16 acres, because Mr. Smith considers 8 acres to be the most advantageous size to operate on at once, all things considered, and when that is completed the rope, anchors, pulleys, &c., are shifted where another 8 acres is cultivated; of course, 10 or 12 acres may be operated on at once, and thus 20 or 24 acres completed without shifting the engine or windlass, but this with an 8-horse power engine is not to be recommended.

Perhaps it may be as well to state, that I have no interest whatever in Mr. Smith's success otherwise than as it affects the farmers as a body. I still hold to the opinion, expressed two years ago in your columns, that the day will come when Halkett's rails will convert the level tracts of England into vast perfectly-cultivated market gardens, when Fowler's general principle will be seen in operation on most of our upland farms, and Smith's cultivator still forcing its way into the more hilly and less practicable dis-

tricts; but ere this we must have many changes, and farming companies must do that which individual capitalists cannot. But, sir, we have now to deal with the present, not with the future, and for the present Smith's is the only system for *general* adoption. I look upon Mr. Smith as the pioneer, the hardy backwoodsman to lead the way for less energetic, less practical, though, perhaps, more scientific followers; in short, sir, I look upon Mr. Smith as the man for us. He is no blind follower of his idol steam; he knows that steam is far more economical than horse-power, where applicable, but he knows full well that it cannot entirely supersede it. His advice is this:—"Do all your heavy work, all the subsoiling and first deep smashings by steam, then pack up your apparatus, and let your horses do the light work; don't fritter away the time and power of steam over light work any more than you would make your horses plough up little corners and odd slips where the spade and fork can work cheaper."

And now, sir, we arrive at a question equally natural and important. Why is not Smith's system of cultivation more generally adopted? I answer without hesitation, Because it is not sufficiently known: I am aware that there are many other most cogent reasons why it is not adopted in individual cases. The tenant farmer who adopts steam cultivation, must be furnished with a tolerably level farm, a long lease, a security of tenure, capital, practical experience, and intelligence, together with many more qualifications, such as the ability to overcome the

prejudice of the men; this catalogue excludes very many, but it includes so numerous a body of farmers, that I still confidently affirm that Mr. Smith's system needs but to be better known to be generally adopted.

Should I, in these remarks, seem over sanguine, I can only say, let those who entertain that opinion not rest satisfied with mere opinion and assertion, but let them go and see the practical working, and judge for themselves; a heavy land farm, free from couch, and in a capital state of cultivation after such a Summer, speaks plainer to a practical man than volumes could do.

I have avoided all statistics as to the cost of subsoiling, smashing, &c., because they have been thoroughly investigated at our great agricultural meetings, and prove unanswerably that steam is very far cheaper than horse-power; my endeavour has rather been to show that the plan is practical and simple, and perfectly within the grasp of our ordinary farmers; and if this be so, surely the outlay of £500, one-half of which goes for a common generally useful 8 horse-power engine, is not so enormous as to frighten our agriculturists.

Steam-cultivation is no longer a mighty incomprehensible something looming in the distance, but it is a fact before our eyes, and landlords and tenants will be wise to give it their earnest attention, for it is a matter of vast and immediate importance to both classes.

I remain, Sir, your obedient servant,

W. B.

NORTHUMBERLAND AGRICULTURAL SOCIETY.

PLOUGHING AND HEDGE-CUTTING MATCH.

The Northumberland Society held its annual ploughing and hedge-cutting match upon Rothill Farm, in the occupation of Mr. Caull, and on the estate of Lord Ravensworth, in the neighbourhood of Whittingham, eight miles west of Alnwick. The weather was extremely favourable, and although the entry of competitors showed a slight falling-off in numbers, the meeting was most successful. A large and highly respectable company, including the principal landowners and agriculturists of the neighbouring county, attended, and appeared to take a lively interest in the proceedings. There were twenty-seven competitors for the first-class prize, given to the best ploughman; seven for the second-class prize, given to the best ploughman under 18 years of age; and seven for the third-class prize, given to the best hedge-cutter. The judges were Messrs. S. Donkin, Bywell, Felton; W. Turnbull, Horton, Wooler; and W. Burn, Broomhill, Aeklington. At nine o'clock in the morning the "tug of war" commenced, and in the manly efforts put forth by the various competitors a spirit of determination was manifested which was unmistakable. Never were the bold peasantry of the North better represented, and never perhaps were a number of men brought together between whom it was more difficult to award the laurels. Their robust appearance and stalwart frames contrasted strangely with their courteous and humble demeanour. The decisions which the judges declared, after a long consultation, were as follows:

Ploughmen of any age: First, a silver watch given by Sir Matthew White Ridley, Bart., M.P. (President of the Society), and £2 by the society—Andrew Bryson, servant

to Mr. R. Carr, Eglington, whose brawny hand the worthy Baronet warmly shook, at the same time congratulating him on the enviable position which he now holds as the champion ploughman of the county. Second prize £4, William Telford, servant to Mr. Gibson, Intakes, Alnwick; third £2 10s., Edward Charlton, Beacon, hough, Gateshead; fourth £2, William Cairns, son of Mr. Cairns, farmers, Branton, Alnwick; fifth £1 10s., Thomas Kinghorn, with Mr. Caull, Rothill; sixth £1, Andrew Stafford, Broomhill.

The best ploughman under 18 years of age: First £3, James Heslop, with Mr. Turnbull, Fanwick, Stamfordham; second £2, William Tate, with Mr. Cowley, the Mountain, Whittingham; third £1 10s., Robert Wilson, with Mr. T. Smith, Chillingham New Town; fourth 10s., Edward Ions, with Mr. Stephenson, Thrunton.

The best hedge-cutter, the man who cuts, cleans, and fences fourteen yards of hedge in the best style: First £2, William Thompson, servant to Mr. Thomas Rogers, Embleton; second £1 10s., William Jobson, Glanton; third £1, Robert Glaholme, with Mr. Caull, Rothill; fourth 15s., Walter Redpath, with Mr. Stephenson, Thrunton; fifth 10s., Thomas Metcalfe, White Mare Pool. Metcalfe was doing his work admirably when he unfortunately cut his hand, and although he went through his work apparently undiscouraged by the mishap, still it was not performed as perhaps it otherwise would have been.

The dinner in celebration of the day's proceedings was held at Mr. Clarke's, the Bridge of Aln Inn, and was attended by a most respectable company. Bryan Burrell, Esq., of Broom Park, presided; the vice-chair was filled by the Rev. R. W. Goodenough, vicar of Whittingham. Sir M. W. Ridley, Captain Burrell, H. Cresswell, Esq., and other gentlemen were present, and an entertaining evening was spent.

LABOURERS' COTTAGES.

THE ROMSEY AND EDINBURGH MEETINGS.

The condition of the agricultural labourer, and the condition of the labourer's dwelling, are questions which daily excite more attention, and are originating a healthy kind of agitation—a storm that will clear, we trust, the horizon of the future. This is no longer a sentimental or a charitable question; it is a question of profit and loss—to the farmer immediately, to the landowner indirectly—which is too real to be any longer neglected.

Close following Mr. Scott Burn's lecture at the Central Farmers' Club, and Mr. Tucker's summary of his statistical survey of the condition of the agricultural dwellings in Berkshire, two public meetings have taken place—one provincial, at Romsey, in Hants, but illuminated by the presence of Lord Palmerston; one national, in Edinburgh, where the Scotch farming and landed interest seem to have been well represented.

Lord Palmerston, as usual, was practical, and related what good results had arisen, at the time the cholera awakened the wealthy to a sense of their duties, from a report, drawn up by a competent authority, on the sanitary condition of the lower class of dwellings in Romsey. Then, as now, the chief need was accurate information. It is much more from the want of knowledge than the want of inclination, that landowners permit the human tillers of the soil to be so discredibly, unhealthily, and unprofitably lodged.

Mr. Cowper, Lord Palmerston's son-in-law, and late President of the Board of Health, followed, in a speech, or rather lecture, which was in parts more amusing than to the purpose; for he devoted a considerable space to what had been done by societies for improving labourers' dwellings, in London, and in such places as Hastings and Redhill—instances in which philanthropic societies have laid out money, and obtained a return for their investments of from $4\frac{1}{2}$ to $8\frac{1}{2}$ per cent. The only persons who can, as a general rule, improve the dwellings of agricultural labour, are, and ought to be, the owners of the soil the labourers cultivate. The regular rent of something like one shilling per week must be the same return that is paid for the stables, the boxes, or the feeding-yards of a farm, unless it is possible to add to each cottage from a quarter to half an acre of land, instead of giving the tenant an allotment at a distance from his cottage: then, a higher rate of per-centage on the value of the land may be easily obtained, and profitably paid.

The Hants landowners who met at Romsey followed Mr. Cowper's lead, and appointed a committee to form a society for cottage improvement, under the Limited Liability Act. This will, no doubt, do good in the suburban districts near Romsey and Southampton, but, except by stimulating agitation and collecting information, will not touch the want of a due number of healthy, decent cottages, on, or close adjoining, every farm.

The Scotch meeting was on a greater scale. Circulars appear to have been addressed to every leading landed proprietor in the country, and although it was not grand by the attendance of noble names, there was a very encouraging attendance of those who will have to "push"

the movement. It was presided over by a landowner, Mr. Stirling, M.P., distinguished as an author, and also known as a successful shorthorn breeder; and the resolutions were, for the most part, moved and supported by leading tenant-farmers, or gentlemen personally engaged in agriculture. The main conclusion was the appointment of a strong committee of inquiry. If that committee does its duty, and publishes the authentic information it will have the power of collating, as great service will be rendered to England as to Scotland, for the main principles of the question rest on the same foundation in both countries—a deficiency and steady diminution of the best class of agricultural labourers, in consequence of the want of a sufficient number of healthy dwellings in the districts to be cultivated. The letters read, and the speeches, although dreadfully long-winded, as Scotch speeches generally are, were full of excellent stuff—facts and figures and axioms equally applicable to our side the Border: A Scotch clergyman, the Rev. H. Stewart, who several years ago established a Cottage Improvement Society as "a tangible peg to hang the movement on," says very forcibly, "I am glad your speakers are to be chiefly farmers, for it is the farmers taking farms on any terms who have caused and perpetuated the evil. If they would look first to the proper housing of their people, instead of last, how soon all would be well! There are factors (stewards), especially lawyers, who look only to the amount of rent, and ask the farmer to put up with the least possible outlay in building."

The mover of the first resolution, Mr. MacLagan, pointed out that, although there is less expense in consequence of agricultural improvement in raising a ton of turnips than before the introduction of modern implements and portable manures, more labourers are required on an improved farm, where twice, three times, four times the number of green crops are grown; the produce per acre being larger, more people are required to store it, besides those required to attend to the pulping and crushing machinery, and to the live stock fed on the increased crops. And this eminent farmer goes on to describe, as the result of his own experience, a picture which might have been the original of what is called in many circles "Punch's exaggeration": "The great majority of cottages in Scotland consist of but one room, which answers the purpose of the kitchen, bedroom, sitting-room, and entry, with perhaps a small bed closet. A cottage of two rooms is the exception, and of three very rare. And when we compare the comfortable accommodation for the beasts on the farm with the state of this cottage, with its unlathed walls and earthen floor broken into holes, we may well feel ashamed that, in a system of agriculture second to none in the world, the labourers, who bear such an important part in it, should be worse honoured than the beasts of the field. I have visited such cottages, and seen the beds occupied by three or four children with the flushed face of fever; on one side the shrouded remains of the mother, on the other the grief-stricken father! If you do not give them three rooms for the sake of decency, of morality, give them at least one room more, and separate the dead from the

living." We do not see any note of how this picture was received—whether with cries of "Oh, oh!" or "Hear, hear"; but it is one of those statements that are not answered by those who describe this or that improvement or the excellent cottages on Squire A. or Lord B.'s estate—the favourite mode of reply—which is no more sufficient than if, when attention was called to a plague of typhus fever in a nest of labourers' cottages, it were answered by a description of the healthy state of the hall, the home farm, homestead, or the gamekeeper's lodge.

Mr. MacLagan argued, that if the rule adopted by farm architects, of providing stabling for one pair of horses for every fifty acres of land, was correct, surely provision ought also to be made for housing the man who drove the horses! The speaker who followed him thought "that each man should have a separate detached, not semi-detached, house, and an eighth of an acre of land; each house to contain two rooms 12 by 14 feet, with a porch outside. The roof to be a pavilion roof, thatched with straw—"the warmest roof in winter and coolest in summer, and a room in the roof." But it seems as if building must be much cheaper, or cottage accommodation much rougher, than in England; for this farmer calculates that such a cottage could be built for £40. "The cartage of materials not charged, and the wood from the estate to be at wholesale prices." In England few profess to build a pair of cottages for less than £150; and the Rev. H. Stuart calculates that a single cottage will cost £110. Mr. George Hope, of Fenton Barns—a name known in England—described the hiring arrangements of his district, which are by the year; the wages paid chiefly in kind, and including a cottage, a garden, a pigsty, and keep for a cow, *which is the man's own property*. And he concluded by laying down an axiom as true in England as in Scotland: "It is true that the poorer classes can do far more for themselves than can be done for them. *But this building of comfortable houses is a thing they cannot do; it depends on the will of the wealthy; it is the interest of both proprietors and tenants that it should be done; it is also their duty.*"

As to the bothies or hovels in which Scotchmen and women are often herded, they were unanimously condemned by the most eminent tenant-farmers; but defended by Lord Kinnaird, one of a family of liberal politics, and great religious and philanthropic professions, in a letter which confirmed the opinion expressed at the last meeting of the Central Farmers' Club, as to the low tone of public opinion on the subject of labourers' dwellings amongst

certain Scotch landlords. There may be another opportunity of referring to the interesting statement made by the steward of the Annandale Estate on the beneficial effects there of granting small holdings on lease to worthy frugal farm-servants, and the discussion that arose on this vexed question.

A Mr. Cadell, a landowner in East Lothian, in a very temperate speech described the fearful immoral results of men and women being crowded together in lodging-houses in his own parish of Tranent, in consequence of "the system pursued of knocking down cottages wherever it could be done;" the result being, that the sons of the more respectable class of farm servants emigrated; the daughters took service in town; and the inferior class, who took their places and pigged together promiscuously in lodging-houses, showed ten per cent. of illegitimate children on the whole births for the year 1860." He said, "It is a tale that ought to be known, because he was convinced that it was want of information which prevented the proprietors from taking means for curing these evils." "Property had its duties as well as its rights; and while the rights of property had been sufficiently attended to, its duties had, in many instances, been grossly neglected."

In reply to these very proper observations, Councillor John Hope had the imprudence to inquire "whether the gentleman who had attacked the landlords had any connexion with public-houses?" and Mr. Scott Skirving, in the same spirit, threw the blame on Mr. Cadell, for not putting down the indiscriminate lodging-houses. There was a fling at Englishmen, too. Mr. Simpson showed his ignorance, by praising that undoubtedly gallant regiment the 93rd Highlanders, for routing the Russian cavalry at Balaclava, and suggesting that the Redan would have been taken had a Scotch regiment formed the attacking force. For his information, we may state, on the authority of one who saw both fights, that the Russian cavalry never really charged the 93rd; no horse fell on their bayonets, and no Highlander under the Russian sabres. The Great Redan, all military authorities agree to have been impregnable—the interior an open space, swept by batteries. The attack was a diversion for the French attack on Sebastopol. There was a little Redan, from which the French were beaten back, and some of the French soldiers then expressed a regret that they had not had a Scotch regiment instead of the French Marines "*ces sacrés marins.*"

However, the Edinburgh meeting was a good one; it prepared for fairly opening and probing a social sore, and that's the sure road to a cure.

BEANS.

The leguminous plants are of great importance to the agriculturist, and occupy a prominent place in the crops grown in many districts of the kingdom. They are used to some extent as human food, but much more so in feeding live stock, for which their exceedingly nutritive qualities render them especially suitable.

Beans are divided into two classes: (1), those varieties which are best adapted for field culture; and (2) those which belong more particularly to the garden. At the same time, some of the latter may be profitably grown in the field. The following are the generally cultivated varieties of field beans:—

The common Scotch, or horse-bean, is extensively grown in Scotland, is hardy and prolific, and well suited for feeding purposes. "In a warm, dry summer, the sample is always more plump, and white in colour, particularly if followed by a dry harvest, and more so when cultivated on a strong, rich clay, than on a light soil, and when drilled than when sown broadcast" (Lawson). The colour of the seed is brownish-white; but much wet weather at harvest renders it nearly black. The height of the straw varies from three to five feet; and the weight of the seed, per bushel, from 60 to 67 lbs. The tick bean is chiefly cultivated in England; is rather more prolific than the Scotch bean, whilst it produces

less straw, and suits a lighter description of soil than the other. The seeds are plumper, but at the same time smaller than those of the Scotch bean. The Heligoland is another comparatively short-strawed variety, is early and hardy, and succeeds well on rich soils. The beans are of a chocolate colour, "pods small, straight, cylindrically shaped, and very numerous, as many as 50 being occasionally found on a single plant; beans 3 or 4 in each pod, well filled, of a roundish or slightly oblong shape, and very small, forming a superior and heavy sample" (Lawson). The weight per bushel varies from 64 to 69 lbs. The winter, or, as it has been called, the Russian bean, is a hardy and productive variety, and is less liable than any other kind to suffer from attacks of the black bean aphid. It is sown in October, and is usually ready to be reaped early in August. It weighs heavily, a bushel of winter beans ranging from 65 to 70 lbs. The straw is of medium length, seeds about the same size as the tick bean, and its general colour resembles that of the tick and Scotch varieties. It tillers freely, and less seed is necessary, therefore, than of any other variety. About two bushels will be sufficient seed for a statute acre, provided the land is in good condition; but it must be observed that winter beans need not be sown on wet, undrained land with any reasonable hope of success. The purple bean derives its name from the peculiar colour which the beans assume on becoming ripe. It is prolific; the seeds resemble in form those of the tick bean; but it is not much cultivated. The Annfield bean is rather productive, but requires a superior, early soil. The seeds are larger than the other varieties of field beans. The pigeon bean, on the other hand, is the smallest seeded of all the beans; but it is prolific and early. A lighter class than the generality of bean soils suits its growth; but it is not much cultivated in Britain. The Mazagan and long-pod or hang-down varieties, although usually considered as belonging to those chiefly suitable for garden culture, are occasionally grown in the field, and we have seen some very good crops of the latter when the land was in good condition.

With the exception of the winter variety, to which we have already alluded, the proper time for sowing beans is in February, if possible, and certainly as early in March as the state of the weather will permit.

Beans are occasionally sown after one year's clover lea, and we know that some growers are well satisfied with the results of this system; but the usual place in the rotation is after a corn crop. In this case it is advisable, if the weather is favourable, to scarify or light plough the land during autumn, afterwards harrowing it, and picking off all loose weeds. This will be of great service in the after-culture of the crop, by keeping the land in a cleaner state than it would otherwise be, because, owing to the early period of the year when beans are sown, and the often uncertain state of the weather, it is not usually possible to do much towards cleaning at sowing time. The land being scarified, &c., dung may be carted out and spread over the field at the rate of twelve to fifteen tons per statute acre, and then ploughed down with a strong furrow. When the land is well drained and moderately level, this furrow is sometimes given across the usual line of ridges. Previous to sowing, the land is harrowed, and if necessary grubbed, so as to break down the surface, and then drilled, the drills being 27 inches apart, in order to allow the after culture, by horse-hoeing, to be properly carried on. Four bushels of seed per statute acre are drilled by a machine constructed for the purpose, the drills being afterwards closed by the plough. When autumn cleaning cannot be effected the dung is

spread on the stubble and ploughed down; and it is of importance that the winter ploughing is got over as early as possible, so as to expose the soil to the action of the weather. Some leave the dunging of the bean crop until the time when the seed is sown, when the dung is put into the drills, the seed being sometimes drilled under the dung, that is, previous to the latter being spread in the drills; and at other times above the dung, both dung and seed being covered by the plough splitting the drills. When it possibly can be done, we consider dunging previous to the winter ploughing the most advisable system, because by this means the work is got out of hand, thereby occasioning less labour at a busy season, when it is of consequence to take advantage of every dry hour, and, besides, it is easier to dung on the stubble than on the ploughed land, and there is less damage done by carting on the land during autumn than at a time when it is not, perhaps, in a very dry state. At the same time, it is not advisable to work the land and sow the seed when the former is wet.

Beans are sometimes sown without forming drills specially for the purpose of receiving the seed. This is done in the following manner: The winter furrow is harrowed down, and three ploughs are set to work to plough the field in the ordinary manner; the seed is sown in each third furrow, so that the plants come up in rows about 27 inches apart. The broadcast mode is also occasionally adopted, the seed being merely harrowed in; but as broadcast sowing does not admit of any after-culture, we do not think it generally advisable. It may do on clean land in good condition; but as a general rule the drill system is the best. Broadcast sowing also requires more seed than drill sowing. Dribbling is also practised, especially in some parts of England, the holes being made $2\frac{1}{2}$ or 3 inches deep, and from 3 inches to 5 inches apart, according as they are dibbled in each alternate furrow, or in every furrow. The seed is also dibbled in double rows 6 or 8 inches apart, a space of 24 to 27 inches being left between each double row. In all cases of dibbling, the seed is covered by a light turn of the harrow. Beans are sometimes grown in Ireland in beds, the seed being covered by shovelling the intervening furrows, the earth obtained in this manner being cast right and left over the adjacent beds. The crops grown by this mode are never so equal as those which are grown in drills, and the bed system does not admit of that semi-fallowing which is of so much importance, both to the beans and the crop of wheat which follows. The bed-system, in any case, is only a make-shift to compensate for want of drainage and for bad ploughing; the deepened intervening furrows acting to some extent in place of the former, whilst the earth obtained by sinking those furrows supplies the want of cover for the seed consequent on defective tillage.

Peas are sometimes sown along with beans, the object of this being to secure a supply of peas-straw, with which to bind the sheaves of beans. The proportion of peas may be a fifth of the entire quantity of seed, when sheaf bands merely are the object, and the peas are easily riddled out from among the beans.

In a fortnight or three weeks after the beans have been sown, a favourable opportunity must be taken to harrow the land; and in the case of raised drills this will be best effected by the curved drill-harrow, a pair of which is drawn by one horse. The plants come up more regularly than they would otherwise do in consequence of this harrowing, and it helps to prepare the way for the after-culture. The roller is also run over the land before the plants appear, and in some parts of England the rolling is not

given until the plants are up, rolling at that stage being intended to prevent the beans running too much to straw before blossoming.

The after-culture consists in repeated horse-hoeing, or grubbing, and hand-hoeing the ground, until the plants have become so far advanced that the horses cannot travel among them without doing injury. Those beans which are grown in raised drills must have the earth laid up to them by the double mould-board plough, when the spaces between have been sufficiently grubbed, &c. The effect of this mode of culture is not only to keep down the growth of weeds, but also, by the stirring of the soil, to bring beans under the class of fallow crops, which is not the case when the seed is either sown broadcast or drilled at such narrow intervals that horse-hoeing can only be carried on to a limited extent.

The composition of the bean plant—grain and straw—point out the class of manures most serviceable in promoting its growth. Thus we find that lime, magnesia, potash, and soda, together with phosphoric and sulphuric acids, form the principal constituents of the grain and straw of beans. Phosphatic manures, therefore, such as the phospho-Peruvian guano, and super-phosphates, sulphate of soda (Glauber's salts), the nitrates of potash and soda, sulphate of lime (gypsum), and common salt, are appropriate light manures for the bean crop. These manures may be mixed together or applied separately. The application of the sulphates and nitrates above mentioned seems, from the results of reported experiments, to act more in promoting the growth and filling of the pods than by increasing the bulk of the straw. The best time for applying the majority of these manures is when the plants are above the ground; and the manures will be thoroughly incorporated with the soil by means of the various horse and hand-hoeings. When the seed has been sown broadcast, damp weather must be selected for the application of the manures, as no artificial assistance can be rendered in working them into the soil in this case. Gypsum, however, may be sown broadcast over the seed in the drills before the latter are split and closed, as gypsum does not act so quickly as the other fertilizers. Lime, it must be observed, is a manure of great importance in bean culture, not only on its own account, as a constituent of the plant, but also from its effects in bringing other fertilizing substances into action which already exist in the soil. Lime will probably be applied at some period or other in the rotation, when beans are properly cultivated; but if applied directly to the bean crop, it may be scattered over the land, and harrowed in after the beans are sown; or it may be applied previous to ploughing the winter furrow, preparatory to sowing beans. When manure is spread on the stubble, and ploughed down, the first of these modes—spreading after the seed is sown—will be the most advisable.

The principal enemy which bean growers have to fear is a species of *aphis*, the bean-plant louse, or, as it is sometimes designated, the "Black Dolphin" or "Collier;" and in some seasons the ravages of this pest are very extensive. The *aphis* makes its appearance soon after the plants come in flower, when they commence on the tops, and from thence rapidly spread over the plant, destroying the leaves, in consequence of which the progress of the beans in the pods is arrested, and the crops prove a miserable failure. Early sowing is of advantage in securing the plants from the attacks of this insect; hence the comparative immunity which the winter bean enjoys in this respect. The state of the plants should be carefully watched at the season when

the *aphis* usually appears; and the only step which the grower can take, should such be the case, is to cut off the succulent tops, and remove them entirely from the field, covering them with hot lime or burning them. This is a better plan than merely cutting off the tops, and allowing them to lie on the ground. But the removal of the succulent tops of the bean plants has at all times a special recommendation, inasmuch as it causes the pods to fill better, more quickly, and more evenly than they would do if the tops were allowed to remain.—*Irish Farmers' Gazette*.

THE SPLASHING OF THE CHURN.

In the dairy, cool and airy,
Stands the farmer's daughter churning,
Her cheeks are all aglow,

With health, from labour, burning;
Her ruddy arms are bare,
In a snood her flaxen hair,
'Round her brimming pans of milk,
And her gown—'tis not of silk—
Is tucked beneath her apron,

Clean and snowy white;
And while the staff is dashing
Up and down, incessant splashing,
In unison with hand and foot
She sings with spirit light.

"Come, Sally! take a turn
At the old wooden churn,
And quit your novel reading,
Nor think yourself a queen;
You're more like silly Nancy,
Who lived on airy fancy,
And died in single wretchedness,
In poverty I ween.

"Here, Mary, in the dairy
Is your proper place, my bonny lass,
An hour and more you've stood before
That flatterer false, the looking glass;
So come; take a turn at the big wooden churn,
'Twill lend your face a glow and grace
That paint cannot impart;
And while the staff is dashing
Up and down incessant splashing,
'Twill set your eyes a-flashing,
Till every look's a dart,
You'll lose that sobbing, sighing,
That pallid look and dying,
'Twill send the ruddy current
Beating time from out your heart.

"Come, hasten, sister Anna;
Stop a-pounding that piano;
Poor broken-hearted instrument,
'Tis ever out of tune;
So cease your useless jiggin,
And bring the can and piggan,
To hold the luscious buttermilk
That will be ready soon;
And keep the staff a-dashing,
Up and down incessant splashing;
Brother is a thrashing,
And father's with the ploughs.

"Mother supper's getting,
And Kate's the table setting,
So let us get the churning done
Ere milking of the cows.
And we'll take a turn
At the big wooden churn;
Tho' 'tis an ancient instrument,
'Tis never out of tune;
And sing while we're dashing,
Plash, plash, plash, plashing,
A lively lay, and bang away,
We'll bring the butter soon."

—*New York Tablet*.

ON THE RE-FORMATION AND RECONSTRUCTION OF FENCES ON THE TILLAGE-FARM.

THE UNTHRIFTY CONSEQUENCES TO TILLAGE OPERATIONS OF IRREGULAR, OVERGROWN, AND OVERGROWDED FENCES, AND THE SIZE AND FORM OF INCLOSURE BEST CALCULATED TO ECONOMIZE ANIMAL POWER IN TILLAGE—POINTED OUT.

There probably is no branch of practical husbandry which more admits of profitable re-formation than the laying-out, constructing, and subsequent maintenance of fences. Much has been written on this important subject, but too generally the statements have resolved themselves into mere technical speculations of the manner of constructing the various denominations of fence, of which the varied circumstances of different localities have led to the adoption. Indeed, in such treatises, so rarely have general principles been relied on, that in expatiating on these as the basis of the following article, we may almost presume to say that the reader perusing it will find himself pursuing a comparatively fresh course of reasoning in this department of rural economy.

Of the passive office performed in farming, by the hedge-row or stone wall or other divisional expedient, it may be preliminarily remarked, that it differs from the great majority, if not all the other permanent agricultural adjuncts to the soil—such as buildings, roads, draining, &c.—in that, while these subserve to purposes of positive gain, the function of fences is in itself absolutely an unproductive one; while, again, no department of the farm is more fraught with oft-recurring annoyance to the tenant, or of disagreement between him and his landlord, than the maintenance of fences. The wandering of animals to a distance is inconvenient, and may even result in serious loss. The fence prevents this. Their trespasses are generally accompanied with greater or less damage, and frequently with animosities amongst neighbours. The well-kept quick-set, or turf bank, or stone-wall avoids these unpleasantnesses. But, in all this, there is no positive gain to recompense the cost of original construction and of subsequent upholding. True, no doubt it is, that while as yet the unthrifty expedient of exposing neat cattle to the inclemencies of latter autumn, mid-winter, and early spring universally prevailed, the shelter of frequent and lofty hedge-rows was, in some sense, positively promotive to the well-being of the unhoused herds; but since a better economy in this matter has come to be practised, by affording them the far more effectual shelter of the homestead, this office has greatly or altogether lost its importance. Accordingly, in some highly-farmed localities, the formerly existing subdivisions have been altogether swept away; insomuch that thousands of acres may be seen devoid of any distinction between field and field, save the difference of crop borne by each on its surface. In this case, the moveable hurdle, or rope-netting, or wire fence is resorted to; and from what motives? Because the conviction is more and more increasing, that the

heavier the crop growing in the tillage-field, the greater the necessity of that free circulation of air promoted by the ever-passing winds, which fences capable of yielding shelter to animals would intercept; because, moreover, the destruction perpetrated by the seed-devouring birds is constantly in the ratio of the number of hedge-rows with which the locality is intersected; nor is it even improbable that those innumerable insect enemies to the corn crops, which insidiously produce disease and infertility in the ear, have their birth-place and harbourage in the coarse and unbrowsed herbage which borders either side of the divisional construction, whatever be its kind. The unproductive space occupied by the fence itself, and the abstraction of vegetative nutriment from the adjoining margin of the field where the enclosing hedge-row stands, form additional, and by no means frivolous, grounds for the absolute discontinuance of this prescriptive mode of separating the surface into parcels of land. But, although this view has been advocated by very orthodox agricultural reformers—such as the late Mr. Pusey—we shall here content ourselves with only deprecating the enormous superfluity and really barbarous laying out and construction of English fences generally, and with demonstrating the pressing necessity of instituting a large measure of improvement in this point of husbandry, to meet the requirements which the vastly-improved methods of modern cultivation demand at the hands of the husbandman, in order to their full development in economic execution and ultimate pecuniary profit.

These preliminary remarks we shall now follow up by raising, and in the sequel answering these questions: In re-arranging and enlarging the existing divisions of the farm, by obliterating such lines of separation as may be deemed unnecessary, and therefore inexpedient, what size and form of field should be aimed at? In constructing new lines of subdivision, what are the operative or technical methods best calculated to procure the early maturity and subsequent permanent prosperity of the fence to be constructed? In England generally, is necessarily implied the use of hedge-row divisions; for, in fact, the command of stone suitable for walling is very rare in that country.

First then, assuming the owner or occupier to be unaffected by any insuperable impediments in forming the new divisions, of such size as may be deemed the best; what is that size? Now, we are not aware that in point of universal application there is more than one rule for determining this problem; and in stating that rule, and giving to it a practical application, a field moderately level as respects general surface, and of medium

texture as regards soil—that is, neither remarkably stiff, and hence difficult to work, nor much the reverse—shall be assumed. Such a soil, a pair of good horses, drawing a well-constructed plough, will turn over, at the rate of one acre a day of two yokings of 5 hours each. To do this, we shall compute that the animals must step out at the rate of one mile an hour. But, on the other hand, it is certain that to keep up this pace uninterruptedly would be impossible without injury to the team; and accordingly the practice of frequent rests is everywhere resorted to; the act of turning at the end ridge being the opportunity usually chosen for the purpose. But whatever seeming propriety there may be in this arrangement, the end ridge may nevertheless be, and often is, an extremely improper spot at which to halt; for this reason—that the true prognostic for pulling up, is on the animals' respiration betokening distress; because by universal assent it is allowed that every step continued after the stage of excitement of their muscular system, indicated by laborious breathing, has set in, is a wasteful overdraught on their physical powers; hence it follows that to push on the animals after they are blown, simply to reach the end of the furrow, is alike irrational and injurious. Yet to stop midway would, on various accounts, be a very slovenly and inexpedient alternative; and, therefore, the necessary induction from this practical reasoning is, that every judicious agriculturist, engaged in re-forming the subdivisions of his farm, ought to give to each a dimension along the line of ploughing, such as will—taking texture of soil and declivity, if any, into account—make the act of turning just anticipate the incipient stage of over-continued exertion in the horses, and no more. Accordingly, under ordinary circumstances, from 270 to 300 yards have by good authorities been pronounced a very expedient length of ridge. But may not the field, very fitly, be made of only half the length here argued for, and thus cause the resting to occur at the termination of each bout or second furrow? Here, however, an objection on the score of waste of both land and time occurs; for, first, a field short in the direction of the ridge involves a disproportionate excess of comparatively unproductive forehead; hence loss of land. Secondly, although the time occupied in turning the team even, without stopping to breathe, may seem unimportant, taken individually, its reality it amounts in the aggregate to a very considerable share of the day's work. To demonstrate this, let us take, for instance, a field extending to the everyway expedient length of 274 yards between end-ridge and end-ridge, and ploughed in furrow-slices of eight inches each. According to these dimensions, 79 furrows must be laid over to complete an acre. Hence, in the ploughing of a single acre, the horses, plough, and man must go through the unproductive process of turning on the forehead, head-ridge, or end-ridge (all synonymous terms) the same number of times as there are furrows. Now, it has been determined by tentative experiment (Sinclair's Code of Agriculture, p. 306) that apart from rests, a minute of time is consumed between the unearthing of the plough at the extremity of one furrow, and the again earthing it at the

commencement of the next: and thus, in the working of each acre, upwards of an hour and a quarter (or, exactly 79 minutes) are spent in what in itself is an absolutely unprofitable operation. It follows, therefore, that if the ridges were no more than the half of 274 yards in length, the time spent in turning would be twice as great; and thus by an easy effort of computation, the cultural unthriftiness of small arable fields is manifestly exposed. By a very experienced land-surveyor and able agricultural writer, it has been calculated that, on an average, the farm enclosures throughout England do not exceed nine acres each. Assuming, then, this area to be reduced to the form of an exact square, the length of ridge would only be 210 yards, giving rise to 945 turnings in the laying out of the furrows of the entire nine acres. At the rate of one minute lost at every turning, this gives 15½ hours squandered in the operation; whereas, assuming the case of a field of 300 yards each way, and containing nearly 19 acres, the turnings would be only 405 more than in the other of 9 acres. As respects saving of land in the matter of head-ridges, the relations of these two instances stand thus: In the field of nine acres the two foreheads; taking each at 15 feet in breadth, would be 2,100 yards; and in that of 19 acres, only 900 more.

Having thus arrived at certain conclusions respecting what ought to be the length along the strike of ridge, let us next reason shortly what should be the width across. Here the operation of cross-ploughing comes to be the guide; and, inasmuch as this implies the working of loose land already turned over, a considerably greater length of furrow may be adopted. Now we have seen that a field 300 yards in length along the ridge, and 144 yards in width, gives an area of 9 acres. Again, an area 300 yards square would contain 18½ acres. But by throwing an inclosure into a parallelogram 300 yards along the ridges, and 400 yards the other way, a space would be embraced of 25 acres, and a cross-furrow obtained neither more nor less in stretch than what a good team may turn over without inconvenience.

At this point, let us next see how good agricultural authorities have expressed themselves on the subject matter in hand: "When a whole farm is divided into fields of various sizes, it is difficult to form a plan so as to suit a regular rotation of crops, or to keeping accurate accounts; whereas, by having the fields in general of a large size, the whole strength of a farm and the whole attention of the farmer are directed to one point, while an emulation is excited among the ploughmen, when they are thus placed in circumstances which admit their work to be compared" (Sinclair's "Code of Agriculture," as cited in London's "Cyclopædia of Agriculture," p. 687). "If fields are of a regular shape, and the ridges of a proper length, five ploughs may do as much as six in fields of a small size and of an irregular shape; while every other branch of labour (such as dunging, sowing, harrowing, reaping, and carrying in the harvest) can be executed, though not altogether, yet nearly, in the same proportion" (art. "Agriculture," Encyc. Brit., vol. i., p. 41, and Supplement). Again: "It must be borne

in mind," says Stephens, treating on this subject, in his "Book of the Farm," "that, other things being equal, the size of the field should in all cases bear some proportion to that of the farm. That proportion I am not prepared to define, although I have no hesitation in giving it as my opinion that below 10 acres is too small a field for horse labour to be employed in, and above 40 acres too large a field for quick despatch of work" (vol. i., p. 360). Of these two extremes the mean is 25 acres, and if the reader will impress on his mind the conception of a field 300 yards by 400 yards, and containing this acreage, he will, in subsequent articles of this series, find that step by step as he follows the argument, these dimensions will more and more recommend themselves for adoption. In addition to the authoritative dicta just quoted, we here presume to remark that, within the discretionary latitude indicated by Stephens, there will generally be found ample scope for the farmer exercising a sound judgment in apportioning the size of his reformed fields mainly on the principles above advocated; yet without irrationally disregarding other circumstances of moment, merely to conform their magnitude and shape to any single abstract rule of economic cogency. For instance, should a material difference of soil present itself in detached areas within the farm, the judicious reformer, in rearranging his fences, will not, and ought not to, shrink from violating mere

typical dimensions, whether in acreage or form, should the doing so enable him to avoid the very grave practical inconvenience of associating dissimilar qualities of soil in the same enclosure—one perhaps heavy and late, the other light and early—and which, if coupled together, must nevertheless be tilled and sown and reaped at the same times, although both cannot possibly be contemporaneously in seasonable condition:

But who is there, qualified by intelligence and habits of reflection to follow up in his own mind the train of reasoning suggested in the foregoing remarks, and imbued with energy to give practical effect to the conclusions thence deducible, who does not believe in the approaching dominion of steam as the motor-agent in all the prime operations of field cultivation? Hence, then, it is beyond measure important to know, as in a succeeding paper shall be demonstrated, that he who resolutely commences the work of reformation in the ill-conditioned fences of his farm, intending with all convenient speed to persevere therein to the end, will be doing that which not only is conducive to the economic use of team work as long as animal power shall be employed in the field, but, at one and the same time, will be thereby converting his farm into a condition fit to receive the benefits of steam cultivation in ample measure and efficiency.

FIELD-PRACTICE.

SIR,—Yours being pre-eminently a "field paper," I cannot do better than introduce to the notice of your readers a little "field-practice."

In the movements of our various rifle corps, we occasionally read of their turning out for field-practice, and that part of their field practice which I now beg leave to refer to is their guessing distances. The rifle, as a deadly weapon, is superior to ordinary fire-arms on account of its longer range and greater accuracy of aim, hence the drill consists in a series of lessons respecting the elevation of the sight, to suit the given distance from 100 yards to half a mile. The first thing to be settled, then, before the sight is either raised or depressed, is the distance of the target from the rifle volunteer. Whether that target be a painted disc, or whether it be the veritable rank and file of mortal foe, there can be no question as to the necessity of calculating the distance pretty accurately; accordingly we find that some persons are shrewd enough to reckon distances correctly at a glance; at all events they hit the mark, and this is presumptive evidence that the means were not much amiss that attained the desired end. Most sportsmen are aware that when they have accustomed themselves to shooting birds on wing inland, they have sadly mistaken the distance of birds on wing over the sea, hence the old practitioners tell you never to shoot at a sea-gull unless you can see the eye of the bird; and as that small object serves as a scale to measure the distance, it is a simple rule for guessing distances, as far as it goes; but unfortunately it goes a very short length.

Educated men, with the use of instruments, calculate distances accurately either by land or by sea by triangulation. A very short base line being given, and two angles, the per-

pendicular length is easily ascertained; but let no one imagine that I am going to quote Euclid, or even say one school-word on the subject. We all recollect that three laths, of the respective lengths of 3, 4, and 5 feet, or of 6, 8, and 10 feet, when laid down, forming a triangle, will have one square corner like a carpenter's square, and this square corner is called a right angle, whereas the other two sharp corners are called acute angles. I must be allowed to state that the gape between two lines is an angle; bear in mind that this one word "*angle*," rightly understood, is the key to the hitting of targets. The finest guess-work in the world could not hold the candle to the certainty of triangulation. Take the foregoing example. Mark out a square on a floor with chalk by a carpenter's square, and lay down the 3-foot lath to the east, and the 4-foot lath to the south, on the chalk lines, so as they meet in the square corner; then lay a wagger as to the distance (without measuring) of the tips of the two laths: you are sure to win. They will be found exactly 5 feet apart; and why? Because you had a measured base line, and a measured perpendicular line, and a right angle. I need scarcely say that the base line, or 3-foot lath, and the slanting 5-foot lath, laid down, the upright or perpendicular distance would be got, and found to be 4 feet. But as the taking of angles without instruments and out of doors is no easy matter, I beg leave to state that there is a species of drawing paper known to architects and engineers as "*section paper*;" it was extensively used by the late I. K. Brunel, Esq. I think he had a patent for the particular kind he used, printed from his own plates. This paper saves all calculations or references to scale, being ruled exactly as a chess-board, in say 1-inch meshes, and again subdivided.

down to hairs' breadths. A piece of this section paper, about the size of an envelope, will give the base line, and the perpendicular line, and the right angle (see the accompanying sketch).



Let the rifle volunteer begin at night to practise distances by placing a candle at one corner of a table, and then place himself with the section paper at the opposite end of the table, and let it be understood that, with three fine needles, or even pins, and this piece of paper, he is to measure accurately and instantly the distance from a given point, at his end of the table, to the candle, at the other end, by triangulation.

To save the trouble of taking two angles, let him lay down the right angle on the table first by putting a needle through the angular point; then set the perpendicular line right from this needle to the candle, and fix the paper there by a pin, merely to hold it in its place; then set out upon the table the base line, and measure it—say 20 inches—and then remove the section paper, but not the needle, and put it as if it had been slid forward till the scale of 20 on the paper comes exactly to the 20 on the table; here put in a needle, in order to get the angle taken, and take care that the base line of the paper is still over the base line of the table, and pointing to the first needle, and when these things are so, look towards the candle, and the third needle will have to be put in on the perpendicular line on the exact distance that is required, for the section paper will now be an accurate plan—a small edition of the larger-sized plan, viz., the table, and you have only to call inches hundreds of yards, and you will have the shooting distances performed by the same means out of doors.

The late J. C. Loudon, author of the "Arboretum Britannicum," had the heights of trees measured for his work by a right-angled triangle moved back from the tree until the angle of 45° pointed to the top and bottom of the tree, and then, by measuring with a tape to the bole of the tree, the base line would of course be equal to the height or perpendicular line, and that without climbing.

It must always prove interesting to riflemen to be able to calculate the distance across a river, for example, or across a marsh or rough ground, when they are to practise; and if it be useful there, how much more so will it be for him to have the confidence in himself that, left to his own resources, and having to lead others or direct his own aim, he can tell the distance that he is from his target, for he cannot walk up to the outposts of the enemy, and, after pulling the nose of his opponent, tell him, "As soon as I have paced the distance of 600 yards back to my ground, I will elevate my sight to the score for 600, and let fly at the third button on your tunic."

ALEX. FORSYTH.

THE BATH AND WEST OF ENGLAND SOCIETY.

A meeting of the Council of this Society was held at Waghorn's Hotel, Taunton, on Saturday, 26th January, 1861, J. W. Buller, Esq., M.P., President, in the chair. There were also present—Messrs. H. G. Moysey, E. S. Drewe, Jonathan Gray, Robt. Smith, John Hooper, C. Gordon, jun., John Widdicombe, W. E. Gillett, Clement Bush, John Gould, M. Farrant, W. Thompson (Bath), Joseph Lush, R. N. Grenville, Gabriel Poole, John Fry, R. K. Meade King, J. D. Hancock, Thomas Danger, Capt. J. T. Davy, and the Secretary, Mr. H. St. John Maule.

TRURO MEETING.—A communication was read from the Committee of Council on Education (Science and Art Department), acceding to an application which had been made to them by the President for a selection of works of art from the Kensington Museum, for exhibition at the annual meeting of the Society, at Truro, during the first week in June next. The Field Steward brought up a report of the arrangements which have been made for the trial of implements in the field at the Truro meeting, which was adopted. A report from the Mess Committee was read, but referred back for further consideration. Mr. John Gray was appointed Steward Elect in the yard at Truro. The subject of the place of meeting for 1862 was considered, but no place definitively fixed.

FINANCE.—Mr. Gillett brought up a report from the Finance Committee, and a balance-sheet showing that,

with a balance of £415 from 1859, the total receipts for the past year amounted to £5,534 11s. 6d.; and after the payment of all expenses, there remains a balance in hand of £488 17s. 5d., exclusive of a sum of £900, which has been voted for the Truro meeting.

LIBRARY, AND OTHER PROPERTY.—A Committee, consisting of Mr. R. K. M. King, Mr. R. N. Grenville, and Mr. Gillett, was appointed, to consider whether the books, busts, models, and other property of the Society, can be placed in any public institution or building in Taunton, and to report at the next meeting.

ARTS DEPARTMENT.—The Secretary read the regulations recommended by the Committee of the Arts Department for the Truro meeting, and also a report from the same committee, which was confirmed.

COUNCIL MEETINGS.—In consequence of its being found more convenient to the members, the Council have determined that in future the monthly meetings shall be held on the *First Saturday* in the month, instead of the *Last Saturday*, as heretofore.

NEW MEMBERS.—The following new members were added to the Society: Mr. J. F. Bassett, Tobidy Park, Redruth; Mr. William Karkeek, Truro; Mr. Wm. Veale, Devonport; Mr. John Cocks, jun., South Molton; Mr. William Francis, Crediton; Mr. W. Featherstone, Wiveliscombe.

RIVER-DRAINAGE.

In a previous number we confined our observations on the river-drainage of our large valleys principally to the hydraulic question, saying very little about the political. Let us now examine the subject from the latter point of view, in order to ascertain how far the respective interests of landowners, tenants, millers, canal and other companies, and the general public are likely to be affected by the most complete system of drainage that the progress of modern science will permit of being carried out into practice.

Time was when the waters of our great rivers were not interrupted by mill-dams, canal sluices, bridges, and other obstructions of this kind; and in very many cases, if not the majority, had they thus been left to flow in the channels which they would have scooped out for themselves, many a valley would have been better drained than it now is. Running water has a natural tendency to deepen the channel in which it flows, and unless where confined between rocky shores, it will soon, provided it has an ordinary fall, scoop out a bed sufficiently deep to drain effectually the adjoining lands on both sides. It is only when beavers and mankind interfere with their ninety-and-nine obstructions that the reverse is experienced. No doubt, toward their confluence with the ocean, tidal action would have a damaging tendency; but we need not dwell upon this part of our story, as there are few mill-dams or other conflicting interests to dispose of at so low a level. The political obstacles in the way of effective river-drainage are almost all upon higher ground; for were there no higher levels than "high-water mark," there would be neither mill-dam nor canal sluice. It is only where our rivers have a fall that we find vested and other interests in the way, and not only in the way of the engineer, but also opposed to the water itself, thus preventing both the natural and artificial drainage of our great valleys, with their tributaries.

In all national questions of the kind under consideration *priority of right must be respected*; and it will readily be seen from what has just been said, that the interest of the public and of the land itself must be allowed to take precedence of that of millers, canal companies, and others, whose rights and interests are only of a secondary, and even a very questionable, if not untenable character—untenable because diametrically opposed to the public weal. At one time, or before the existence of railroads and steam-power, they were no doubt the lesser of the two evils then experienced by the public; but such a plea can no longer be advanced in their behalf. Their rights, in a national sense, are long ago defunct, so that their existence can only now be viewed in the light of a tolerated nuisance, held under a sort of Rob-Roy tenure. We would studiously avoid comparing canal companies and millers to beavers; but we cannot shut our eyes to the fact, that there is nevertheless something circumstantially similar, not only in the

rights they both enjoy to obstruct river drainage, *but also in the character of their engineering works*. Indeed, the removal of the latter would, in our estimation, be a greater national sin than the removal of the former, for the one would gain by the change, which is more than could be said of the other.

But is it not possible to carry out an effective system of river-drainage, and at the same time retain all the water power for driving machinery and water conveyance at present in operation? If this can be done, it will then appear manifest that political rights are subject to examination from a different point of view; for under such a condition of the case, if millers and canal companies are removed or lose their water-powers and water conveyances, they have themselves to blame. Let us, therefore, examine our subject very briefly from this politico-engineering point of view, confining our observations to first principles or data of general application in both cases—water-power, and water-conveyance—permitting every landowner to drain into the river opposite his lands on either side.

If we suppose a river has a fall of 200 feet, and that this is subdivided into 20 water powers or falls of ten feet each, then by removing the lowermost fall, or the one towards the confluence of the river with the ocean, the river can be deepened ten feet, and the nineteen falls remaining preserved for water power and canal conveyance. Under such an hypothesis the tidal part of the river would be deepened so as to permit the navigation of coasting craft inland as far as the second mill upon the river; and as this increase of depth is ten feet, the fall at the second mill-dam would now be twenty feet. The surface of this mill-dam could therefore be lowered ten feet, without depriving the miller of any water power, which would consequently give the third miller twenty feet of a fall, and so on, until we reach the twentieth mill-dam, which would be lowered ten feet to permit of the drainage of the upper level. All this is very simple engineering—at least upon paper; for under the hypothesis that a depth of ten feet below present levels, with a proper width of channel, would effectually drain our great valleys, the work could be executed so as to keep the highest flood water many feet below the surface of meadows and arable land.

There is therefore more than one plan which may be carried out in improving the river-drainage of the country. Two of these have been noticed—the above one of lowering mill-dams and canals some ten feet, or a sufficient depth to allow of the thorough drainage of all adjoining lands; and the other, of sweeping away canals, mill-dams, and every obstruction of the kind, as contemplated in a former article. Besides these two, many other intermediate propositions may be enumerated, according to the circumstances of the different individual cases. So far as we propose discussing in this paper, the whole may be embraced under the above two plans—

the removal of canal sluices and mill wheels from our rivers in all cases where they interfere with perfect drainage; and the lowering of both to a depth that will effect a similar result: each of which is surrounded by many questions, both political and engineering, deserving of mature deliberation.

Before proceeding to examine the above two propositions as separate questions, it may be well to observe one notorious fact—that originally, or at one time, only one of them could have been enunciated as a sound practical question of river drainage. In other words, it is only because our forefathers adopted the beaver-system of engineering, in the raising of mill-dams and canals to the highest possible level so as not to divert the river from its course, that we have now to propose lowering mill-wheels and canal sluices. For example, were there no such obstructions in our rivers as mill-dams and canals, the original or natural state of things before the country was inhabited, or rather, we may be permitted to say, before millers and canal companies took possession of our rivers, who, in modern times of thorough drainage, artificial manuring, and steam-culture, would ever entertain the proposition of erecting mill-dams and canals as they now exist? Before we find a parallel case to this, we must go to the FAR WEST, where colonial enterprise has not yet set its foot, but where black men and beavers ply their respective avocations. Millers and tail-back-water-squires may put on long wry faces at such comparisons; but it is only when their tenure of existing things is examined from this political point of view, that its fundamental integrity can be seen in its true light, for it is only when the superstructure rests on a solid foundation that its stability can be considered permanent. Were no such obstructions in existence, Parliament could not pass a statute which would enforce their construction at the present day.

The conclusion of the primary political question is thus a very plain and self-evident one—that if canals, mills, bridges and other river works had been properly constructed originally, the country would not have been called upon as it now is, to interfere with vested and other rights. But because such works were originally imperfectly planned and executed is no valid reason why the misdoings of the past should be experienced as a barrier to the well-being of the present, but the contrary; the best and most cogent of all political reasons for Parliament ordering mill-dams, canals, bridges, &c., &c., either to be lowered or removed, so as to allow river drainage to be effectively carried out the one way or the other, for the annual flooding of our great valleys, cannot, under any circumstances, be longer tolerated.

The practical question thus comes home to every miller's, canal company's, and any other party's door, who has an interest in improperly executed mill-dams, canals, bridges, and other river works. Lower your works to a level compatible with proper river drainage, or move. Or the question may stand thus: Lower your works or remove them, and leave rivers, as you got them in their original or natural state, free from artificial obstruction.

So far as canal companies are concerned, we fear they cannot invest the necessary capital to lower their levels inland, and compete with railroads. In many cases rivers may be deepened towards their confluence with the ocean. The inland navigation of our coasting craft may thereby be greatly extended, as they can compete with railroads. In effecting improvements of this kind, capital may be profitably and safely invested; but beyond this the general question of lowering inland canal levels appears to be a very problematical one. To all general rules there are exceptions, it is said; and it is for canal companies themselves to say whether they can plead the exception or not. It is sometimes not a very expensive undertaking to raise canal levels, but to lower them some ten feet is a very different proposition when practically considered on the spot; for in the vast majority of cases we presume it means not only a sweeping removal of all obstruction to river drainage, but afterwards the commencement of the undertaking *ab initio*.

Millers and *tail-back-water-squires* would, we apprehend, find the lowering of mill-wheels and mill-dams an equally expensive process. In the vast majority of cases that have come under our investigation the better and more advisable plan is for parties to erect a steam-engine before they commence to lower their water-wheels; for by doing so they would not only require less fresh capital, but they would also be enabled to retain the business, which, ten to one, would be lost during the lowering of the mill-dam and water-wheel. It is the business that makes the water-power worth anything, and therefore parties—*especially those whose title deeds are at their banker's*—had better think of this in time. In many of those cases the corn had first to be carted from the town to the mill, and when made into flour had to be brought back again to town for sale; thus involving a double expense of cartage, which would be saved were it ground by steam-mills in town. Add to this a certain amount of damage which both wheat and flour must of necessity sustain, and we have another tangible argument in favour of a timely removal of antiquated mill-dams and water-wheels from our rivers. These are facts that must be practically disposed of—facts which must satisfy every unbiassed mind that, with such odds in its favour, steam in all such cases must eventually triumph over its rival, water-power.

With regard to bridges, acute angles, or bends of rivers, &c., much more harm is experienced from imperfect works of this kind than appears to be generally credited. Until a sweeping clearance is here effected, and a proper water-way secured, it is hopeless to think of a satisfactory system of river-drainage; for it is to obstructions of this kind that a large amount of flooding is now due. At acute bends and bridges, flood-water has to be raised many feet—what may be termed extra-altitude, in order to acquire a sufficient velocity, to pass such obstructions. The question is a very simple one to those who have paid any attention practically to this branch of hydraulics. Cases have come under our own investigation, where this extra-altitude exceeded ten feet, and where, had the river been deepened and widened at that place, so as to give it a sufficient capacity of water—

way, the water would have been lowered more than ten feet, and the lands above relieved from flooding. Those interested in cases of this kind should therefore make up their minds to sweeping measures, as there is but one way of disposing of obstruction of this kind to river-drainage. Bridges and bends ought to be so constructed as not to increase the depth of rivers. In other words, the inclination of the bottom, depth of water, and velocity should be as uniform as possible. The *modus operandi* of effecting this, will, of course, depend upon the special data of every individual case. One thing may safely be said by way of generalization—many a pet corner of laud, and not a few favourite old bridges, will have to disappear, before our large valleys are successfully drained, and landowners allowed to drain each his own lands into his own part of the river.

We cannot close these cursory observations on so important a national subject without offering a word of caution against *jobbing of every kind*. To do the work ten times, instead of only once, would no doubt afford more pay to hydraulic engineers and navvies, to say nothing of lawyers', Jews', and bankers' pockets. No small amount of the opposition to railroads passing through estates arose from the out-of-the-way hiding places, in which title deeds were found; and no doubt it is possible for Jews and lawyers to play a crafty game at "*hide-and-seek*" before the rights of some tail-back-water lairds make their appearance. But

nothing can be more objectionable than patch-work jobbing—works no sooner finished than requiring to be done over and over again. Why should landowners be called upon, in an age of *free trade*, to support monopolising statute companies, at an enormously extreme expense, in draining their lands each through his neighbour's properties, in order to find an outfall several miles, it may be, lower down the river, when under a proper system of drainage each could drain his lands into his own portion of the river at a fraction of the expense? Why deny to them nature's rights, and the privilege of exercising their professional functions as loyal subjects—as honest industrious citizens of the realm, and as demanded of them by statute law, common sense, and the progress of things? Why subject them to all this, for no other reason than to uphold a state of things never contemplated by Parliament or statute law? We repeat, Parliament never authorised canal companies and tail-back-water squires to flood our valleys as they now do. By whose authority then do they enjoy this "*right*," as they are pleased to call it? Such a "*right*" is more than Queen, Lords, and Commons can grant, or even uphold, much less justify—a right only upheld by perverted law, court intrigue, and a beaver system of engineering more easily imagined than described. In short, it is not a "*right*," but a national grievance which Parliament is in duty bound to redress.

ENGINEER.

THE FARM AND THE RAIL.

The blessings of railways are coming to be pretty generally appreciated. Even the old-fashioned country squires who swore terrible oaths never to travel in such a way are now and then to be discovered in snug corners of first-class carriages. Respectable, far-seeing provincial towns, whose great boast it had been to keep the nuisance at arm's length, have now strong hopes that their little Bill for the Junction line will get through; and sportsmen, once in absolute despair of ever seeing another good thing with hounds, find the monster the very ideal of a pleasant cover-hack. Of course agriculture has not gone without a fair slice of this common good. Indeed, if we recollect aright, a smart gentleman wrote a book to show that farming and farmers would have been little or nothing without the railways. They did not think—they did not travel—they did not see anything—they got nothing new—they didn't progress as they should do, until they went "*express*" through the country. And then the guard's shrill whistle acted in a moment like the crack of harlequin's wand! They pulled off their top coats and their top-boots. They threw off their old habits and their prejudices; And lo! they were good quick men of business, who meant to have the best of everything and make the most of every thing.

That is, always assuming with the aid of the railways. It was soon proved, moreover, that any such

understanding must conduce to a mutual benefit; and market-trains, and cattle-trucks, and loads of corn, became alike household words at the homestead and the station. If the farmer was only half the clever fellow he should be, he at once turned his attention to that ready transit the line offered; and if the directors were worthy of their seats, they did as much to encourage the countenance of an agricultural district as they would that of a manufacturer or a coal mine. Wants like these grow by what they are fed upon; and if "*the goods train*" bring us cake, and seed, and manure, it is a palpable truism that the same Company may take off the produce again in cattle and butter and corn. Either are, then, alike to be blamed, if they do not make the most of the opportunities before them; and whether it be a question of profits or dividends, it is one that "*the shareholders*" should not hesitate to put. "*Naturally enough*" one would take it to be all one way. If there be any neglect, the farmer, in many parts, has still scarcely got his eyes open; while "*the Railway Authorities*," on the contrary, continually plume themselves on the energy with which they develop new sources of traffic.

Strange as it may sound, the actual position of parties is coming to be reversed. It is not the agriculturist that any longer requires to be drawn out, but it is

rather the Director who must be forced up to his collar. Let Mr. Pink, of Wood End, near Fareham, tell his own story:—"When I undertook Mr. Chamberlayne's agency, and went over that portion of his estate at Baddesley, I found a large tract of enclosed land of a good description, but requiring chalk. The tenants, alive to the advantages of chalking, had, when opportunities presented, brought back now and then a few loads, and where put the land is worth at least 50 per cent. more money. In Baddesley there are about 700 acres of common land, much of which would be capital land if broken up and chalked. None of the Land Improvement Societies could advance money for chalking; but last session Messrs. Morrison, the millionnaires, applied for an Act to embrace all that former Acts included, and, in addition, obtained like powers to borrow for chalking. I was employed to write a report on the benefits of chalking, and, although there was considerable opposition at first, the Inclosure Commissioners were convinced, and gentlemen on the committee of the House of Lords gave way. This Act enables landowners to borrow, therefore, for chalking, paying, I think, 6*l.* per cent., which pays off principal and interest in about 21 years. Our tenants would pay the whole 6*l.* per cent. rather than not have it done. I was offered, a few weeks ago, 6*s.* per acre, or 30 per cent. increased rent of a farm, if I would chalk. The Salisbury and Bishopstoke Railway passing through Baddesley, and also through the chalk stratum of West Dean, and seeing a notice at Chandler's Ford Station that applications for chalk should be addressed, I believe, to Mr. Scott, the traffic manager, I at once made application. I ought to inform you that prior to this I arranged a meeting with the Company's engineer, to ascertain if there was any difficulty as to a siding at the spot where the chalk would be required. Having obtained his opinion in favour of my scheme, I applied to Mr. Scott for 20,000 tons of chalk, to be delivered in two years, at such times most convenient to the Company, offering to pay any fair rate for delivering the chalk, the whole of the expense of the siding; and I will pay the pointsman, if necessary, and erect a temporary dwelling for him if required. I did not offer the two last items, because I received a reply from Mr. Scott that the Company declined the matter. I then applied (by Mr. Chamberlayne) to the Hon. Mr. Dutton, who caused the subject to be brought again before the board, and I only received a similar reply. The point selected for the siding is almost midway between Romsey and Chandler's Ford, and equally convenient for Sir William Heathcote's estate as Mr. Chamberlayne's. I had seen Sir William's agent, who was pleased at the project, and no doubt would take another 20,000 tons; besides these gentlemen there are other landowners who would, no doubt, avail themselves of the privilege."

This is an extraordinary array of plain simple facts. Here is business on the line guaranteed for years, and with what a prospective! Experiment already proves that the land increases immensely in value by the use of such a material, or, in other words, that it increases

in *produce*. It is not one proprietor merely who might profit by such a convenience as that asked. "There are other landowners who would, no doubt, avail themselves of this privilege." The Company's own engineer makes no difficulties over the offer, which was up to "any fair rate;" but the Board twice refuse to entertain it. And so the wealth of the country is curtailed, and the food of the people is kept down, solely, as it would seem, that the Salisbury and Bishopstoke line should be made to pay as little as possible. Facts like these speak very much for themselves; and in his extremity Mr. Pink, as it strikes us, goes very wisely to work. He does not go to law and insist on a public Company doing all it professes by its very existence to do for the public convenience. He does not ask the influential country-gentlemen to persist in worrying the wooden-headed Board. He does not even write to the papers; but he regards the matter from his own point of view, as what it really is—a farmers' question. Accordingly he draws out that succinct statement we have just given, and then sends it off to his own local Club. This is the Botley—fortunately an institution of some active energy—and the well-known Mr. Spooner, the Secretary, at once goes into the case. At a Meeting of the Club, he showed what good customers to railways the farmers had become; while Mr. Warner, the President, insisted on the liability of the company as public carriers. A debate, that was inevitably all one way, was concluded with the passing of the following resolution: "That on account of the monopoly they enjoy, and the large quantity of land they have severed and destroyed, the Directors of the London and South Western and other railways are under a moral obligation to render every possible assistance towards the improvement of the land in the neighbourhood of their lines, by transporting, at the lowest remunerating rate, chalk and other minerals needed by the soil, and laying down or assisting others to lay down the necessary sidings for the purpose, in situations most convenient to the owners and occupiers of the land."

We are not quite sure that this resolve puts the chief point quite as prominently as might be. We are inclined to regard the subject more as "a commercial question" than "a moral obligation;" and perhaps after all Mr. Pink's own statement of facts is the best argument. The Club, however, was the very place to discuss the matter, and most probably "it will not end there." It is too late this session for the Central Club to interfere, as its programme for the year, it will be seen, is just issued. But should there be a scarcity of material to select from hereafter, let not this topic be overlooked. Farmers and railways have yet some little to learn as to how they may become of the most use to each other, and there is a smack of novelty about the broaching of such a subject in open debate that of itself promises well. What lots of things there would be to ask for, and what improvements to suggest! But so far Mr. Pink has the credit of having chalked out the line for us.

THE OVER-FATTENING OF SHORT-HORNS.

ADDRESSED TO THE COUNCIL OF THE YORKSHIRE AGRICULTURAL SOCIETY, BY MR. FAWKES, OF FARNLEY.

You have, in the premiums which, with a view to the improvement throughout the country of horned cattle, offered in your show grounds, selected, and I think with great judgment, as most deserving of your patronage, that breed called the Improved Durham, or, more commonly, the Short-horns; as, after a ten years' close attention to this breed, my experience convinces me that, under proper management, no breed can be brought to an earlier or more profitable maturity of usefulness to the proprietor and the public, and none under rational treatment combines so large an amount of the desiderata of butter and beef.

But, in the task that you have, and so laudably, assigned yourselves, of promoting the increase and improvement of this breed in the country, you seem wholly to have lost sight of the consideration (and yet one so indispensable to the success of your object) of the natural character and propensities of the breed in question; for, as though their milking properties needed none of your encouragement, their feeding qualities all of your fostering care, and as though you had to guard in your treatment of them, not against an innate inclination to plethora, but atrophy, you have at all your shows, and in the commendations and premiums that you have bestowed, encouraged, nay, insisted on, as a requisite to successful exhibition, a condition of the animal which all experience and all authority on the subject tell us will be prejudicial alike to its powers of calf-bearing and milking, will prevent all usefulness in the cow, and is preparing the heifer for no other power of profit to its owner than the prematurity of its prize beef, and the posthumous, but very questionable, so far as its possessor's advantage is concerned, honours of the shambles.

Now, were it a point of any doubt or dispute, as is the case on the subject of the deeper or shallower draining, whether the stock intended to serve the purpose of reproduction were injured or not by that early obesity which, so far from attempting to correct in their natural temperament, you, through the medium of your judges' awards, do all in your power artificially to promote, I had still permitted the great reluctance that I feel to find any fault with your proceedings to be sufficient excuse to myself for a more protracted silence; and, though convinced what alone would be the result of your prolonged experiment, and what intermediate injury was entailed upon the consumers as well as producers of animal food, I had, however, impatiently waited upon your own convictions. But as I have never heard a contrary opinion hazarded, and as my own experience, as well as that of all the practical men of the past, as well as the present age, to which I have had access, assures me that the indisputably unnatural show-condition of the animal, as you teach us to consider it, is anything but that state of its being which, whether in the heifer or the cow, can benefit the public, or permit its owner the profitable exercise of his calling and his capital, the present prices of all animal food, so confirmatory of the otherwise notorious fact that the increase of cattle in the country is becoming lamentably unequal to the sustenance of the community, forbid, if nothing else would, that I should hesitate to denounce the system that you are pursuing in your show-yards, as encouraging a waste of the food of animals, and a waste of the food of man.

And if that premature and over-feeding, so indispensable, we all know, to your show condition, be (as I think you must allow it to be) unnecessary to the fullest development of the frame and functions of the adult female, on what plea, I would ask, can you, whose professed object it is so to direct the operations of agriculture "that the greatest amount of produce may be obtained at the least possible cost of production," justify to yourselves proceedings which not only provoke to a waste of food, but are, in the abuse of it which they encourage, converting nutriment into poison?

You will scarcely, I should think, hazard (were you adventurous enough) to attempt a defence of these proceedings, involving that intelligent class of farmers from whom your judges are selected, in the contempt that would devolve upon the argument, "that to assure yourselves of the propriety of their awards of your premiums, form, frame, and quality are not enough, but the fleshy condition of the animal presented to you can be the only safe index to the futurity of fat either in itself or its progeny." And here I may ask you to reflect of what useful instruction to the young farmer you are by the permission of this show condition depriving yourselves; for what can be more important for the young farmer to know, what more advantageous to him, that he should learn, by a process less costly than his own unaided experience, how to select for purchase in the lean fairs the animals that are most calculated to realize his expectation on their re-sale in the fat markets?

But it is not that you so unnecessarily deprive yourselves, in the awards of your premiums, of this important instruction to the young farmer that I have only to complain, but that, instead of directing him to a right judgment, you are assisting him to a wrong one, and teaching him to suppose that nothing else is requisite to excellence in the cow than what is necessary to perfection in the ox. You are also depriving him of the sight, at your shows, of the best animals for breeding purposes as models for his guidance in rearing or purchasing; as the best and most useful cows of every herd must be—as long as you adhere to the system of making a gaudy condition of the animal a *sine qua non*, as now, to its success—of necessity left at home, from their inability to have been, previously to the show, performing two irreconcilable processes at once, of putting on your condition, and doing their duty with profit to their owners.

By the local—more limited in membership, and much more limited in resources of a moneyed as well as moral influence—fraternities of the same character as yours, I feel that it might be urged, though inexcusably, I think, even by them, that this gaudy condition of the exhibited animal was necessary as an attraction to the show-yard, and the funds so acquired absolutely requisite to the existence of the society; and so, in fact, the promulgation of error indispensable to the circulation of truth; but from a society like yours I can expect no such humiliating confession. Nor will you, I am confident, as I might surmise as the motive in agricultural societies less firmly rooted than yours, from a disinclination to that reform in their and your proceedings which I am now advocating, permit the public or myself to suspect that you fear to give umbrage to the affluent, and possibly hitherto influential few,

who, adopting farming as a pastime only, and having no ulterior views in the acquisition of a herd beyond the exhibition of their extravagant estimate of the value to them of these mere playthings at the sale, or their power of pampering these favourites of fashion in the show-yard, might possibly retire in despair from a competition at your meetings, if flesh could no longer prevail over form, nor intelligence be obliged to succumb to oil-cake. But though assured, if you do intend to maintain your position, that you will adopt a more dignified and spirited line of defence than any such, it is so inconceivable to me by what process of reasoning you will attempt to stand up for a practice which is so entirely at variance with the theories on agriculture which you disseminate—lessening, instead of increasing, as it does, the production of the animal, and increasing, at the same time, instead of lessening, the cost of its production; or by what argument you will support a system which so debar the professional farmer, who has too much good sense and too little superfluous cash for the indulgence of extravagance and absurdity, from any chance of partaking of those prizes which you profess to hold out as incentives to his adoption of an improved breed of cattle, that I will not occupy your time in so vain a speculation; but, hoping that you may be more inclined to a remedy of the evil I complain of, than a rejection of my suit, I will hasten to assure you that, as “with the will there is always to be found the way,” that there is no reason for supposing the course I recommend you to belong to the exceptions and not to the rule; and as nothing can be to the experienced in cattle more easy to detect than the presence of an unnatural and purely artificial state of condition, so nothing can be easier than to make such a state of the animal a ground of exclusion from all power of competition in—nay, I would go further—from all permit of entrance into your show-yards. Such a rule as this, rigidly enforced as it must be, to be of any avail, would necessarily, I am aware, exclude from exhibition many, because

irremediably fat, otherwise valuable animals; but it is surely preferable that these should be excluded, than that, through their admissibility, an incorrect estimate of in what consists the perfection of the animal for reproductive and all other useful purposes should be engrafted on the farmer's mind. The remedy, however, cannot, I am persuaded, long halt upon your resolves to effect it. Insist upon the regulations of your show-yards becoming subservient, instead of, as they now are, obstructive to the objects you profess a wish to promote by them, and so rule it that your practices shall become in harmony with your theories, and you will have accomplished all that the public interests require, or that I ask at your hands.

The following are the rules which Mr. Fawkes has suggested:

“1. All the cattle duly qualified for competition to wear round their necks, in the show-yard, labels bearing certificates from their owners of the years and months they are old.

“2. No 2-years-and-5, 6, 7, 8, 9, 10, or 11-months-old heifer to be qualified for competition, unless she bears on her label a certificate from her owner ‘that she is six weeks past her bulling,’ and her premium not to be paid till she has produced a live calf.

“3. No 3-year-old heifer to be qualified for competition unless she bears on her label a certificate from her owner ‘that she is five months gone in calf,’ and her premium not to be paid till she has produced a live calf.

“4. No three-years-and-six-months-old heifer to be qualified for competition under any circumstances.

“5. No cow, not in milk or calf, to be qualified for competition. Each cow to have on her label a certificate from her owner ‘of how many live-born calves she is the dam,’ and her premium not to be paid till, if in calf and not in milk, she has produced a live one.

“6. No yearling bull (if one-and-a-half years old) to be qualified for competition unless he bear on his label a certificate from his owner, ‘that cows are holding to him.’

“7. No two-years-old or aged bull to be qualified for competition unless he bear on his label a certificate from his owner ‘that he is the sire of twelve live-born calves.’”

PLOUGHING MATCH AT BROCKLEY WHINS.

The annual ploughing match, in connection with the East Chester Ward Agricultural Association, took place on Jan. 31, near to the Brockley Whins Station of the North Eastern Railway, not far from South Shields. The fields comprised an oat stubble and two clover leas, in the occupation of Mr. J. Hardy and Mr. W. Wheatley, of the North Pastures. The entries were never perhaps more numerous, and included the very best ploughmen of the counties of Northumberland and Durham. Our assertion will hardly be doubted when we state that there were three classes of competitors, viz., any-age ploughmen, with ploughs of their own choosing; any-age ploughmen, with swing-ploughs; and plough-lads, under the usually prescribed age, 18 years; and that the first prize in the two first classes was £4, and a silver medal, with proportionate second and third prizes; and that in the third class very liberal prizes were provided out of moneys bequeathed for this object specially by the late Dr. Winterbottom, an aged gentleman, whose death a year or two ago, the inhabitants of the neighbourhood in which he resided had much cause to regret, notwithstanding that he left a very large sum of money to be devoted to charitable purposes.

The weather was everything that could be desired, and induced large numbers to attend—indeed quite a holiday was made of the occasion. The ground was in excellent condition. The judges (Messrs. Coxon of Plawsworth, Cairns of Callerton, and Reay of Berwick Hill) awarded the prizes as follows:

Class I. First, £4 and a silver medal, Thomas Eltringham, of Croxdale; second, £2, W. Mitchelson, of Kibblesworth; third, £1, Thomas Jamieson, with Mr. Yellowley, of East Boldon. Jamieson was successful the day before, at the Derwent ploughing match.

Class II. £4. and a silver medal, Geo. Wilson, with Mr. Fish, of East Boldon (this man was also a winner at the Derwent match); second, £2, Geo. Reay, with Mr. Thos. Wood; third, £1, John Norris, with Mr. Brown, of Walker-on-Tyne.

Class III. First, £2 10s., and silver medal, James Hutchinson, son of Mr. Hutchinson, of Castle Eden; second, £1, John Snowden, son of Mr. Robert Snowden, of Washington; third, 15s., Robt. Richardson, of Oaston Colliery; fourth, 10s., Wm. Walker, son of Mr. F. Walker.

At the dinner, which came off at the Golden Lion, South Shields, there were more than a hundred gentlemen present. The Mayor (R. Wallis, Esq.) presided. In the post-prandial proceedings, the following prizes for green crops were distributed: A silver medal to Sir Hedworth Williamson, Bart., for the best four acres of wheat; and silver cups to Mr. John Anderson, of Horsley Hill, for the best crop of potatoes; Mr. George Murray, of Heworth, for swede turnips; Mr. George Easton, of Horsley Hill, for yellow turnips; and Mr. H. G. Henderson, of Bog House, for white turnips.

KINGSCOTE AGRICULTURAL ASSOCIATION.

In consequence of the usual day of holding the Monthly Meeting of this Association falling on Christmas Day, it was held on the following day (Wednesday), at Hunter's Hall, and taking into consideration the holiday season and the severe state of the weather, was well attended. The president (J. T. Harrison, Esq.), from detention at home, not having arrived at the time of commencing the business of the evening, Mr. F. Burnett was called upon to take the chair. The subject for discourse was on "The relative merits of Grazing and Dairy Farming," the introduction of which had been kindly undertaken by Mr. Savage. After the minutes of the previous meeting had been read, the Chairman remarked, the subject for consideration was one in which the members of the Vale district of the association were more directly interested and connected, than those of the hill, and he was much pleased to see so large a number of them present. From his scanty knowledge of summer grazing, he could not himself enter into the merits of the subject; but he doubted not, however, Mr. Savage was prepared, and would do so most ably; and from the number of practical persons he saw around him, he felt certain a very interesting and profitable discussion must follow. He would, therefore, without any further preface, call upon Mr. Savage to give his views on the matter, which he did as follows:—

In appearing before you to-night (remarked Mr. SAVAGE) to read the paper I hold in my hand, I must beg you to recollect who and what I am, a tenant farmer, totally unaccustomed to publicly addressing a meeting of this kind, but endeavouring by perseverance to gain an honest living, and at the same time, so far as I possibly can, improve the land I hold, and the quality of my stock. If I had the ability of many of the gentlemen I see present, the few remarks I am about to make would come in a much better form, but you must take the will for the deed, and excuse all my errors, for I assure you, no man can possibly have a greater desire for the extension of agricultural knowledge than I have, whether it be in the cultivation of the soil, or the improvement of stock; and after the very many excellent examples we have had set us in this neighbourhood, by the late Lord Ducie, Colonel Kingscote, and other large landowners, and also by many tenant farmers, I do think we should be something worse than dunces if we did not put our shoulders to the wheel, and help, with all our might, the good cause; for, depend upon it, there are very few soils but will yield an abundant return for the labour bestowed upon them; and he that increases its produce is a great benefactor, not only to his neighbourhood, but the country at large. Having made these few remarks, I will now proceed to give you my views as to the Relative Merits of Grazing and Dairy Farming. The chief end of all business is, of course, the acquisition of profit, and it matters not whether we are farmers or tradesmen, if we wish to succeed in our undertaking we must have a thorough knowledge of our business, sufficient capital to carry it on, and a willingness to expend it, in a liberal, yet prudent, manner; to this must be added great industry and perseverance. To a company like the present I need hardly say how important it is, in purchasing stock, to select animals most suitable to your soil and situation of your farm, nor of the necessity of providing shelter for them, and giving them careful attendance, and the best nourishment your land will produce. Whether our farms will pay us best

as grazing or dairy farms depends vastly upon its quality; but in the examples I am about to give, I take the average grass lands of our own neighbourhood. Doubtless the very rich and fertile soils of some of the midland counties are best suited for grazing; whilst, on the other hand, much of the land of this county, being of a lower quality, appears more adapted for dairy purposes. I will now proceed to give you my calculations of the cost and produce of three beasts, the first two being grazers of a higher and lower quality, and the third an average dairy cow. I will begin with the better-class grazer.

Grazer bought the 1st of February, at.....	£14 17 0
Keep on hay, from 1st Feb. to 19th May, 14 weeks, at 4s.	2 16 0
At grass, from 9th May to 3rd Oct., 21 weeks, at 4s.	4 4 0
Keep on hay, from 3rd Oct. to 18th Dec., 11 weeks, at 2s.	1 2 0
Roots, &c., not produced on the land, but given during the last eleven weeks, at 8s.	4 8 0
Attendance.	1 3 0
Risk from sickness or injury.	1 5 0
Ten months' interest on first outlay.	0 12 0

Making a total cost of £30 7 0
Sold the 18th December.

We will now see what she will produce, which will be about as follows:—

We will call her 8½ cwt., at 70s. per cwt.	£29 15 0
Allow for rough keep left on the land.	1 0 0
And as she has been eating artificials, I reckon the manure made to be worth.	1 0 0
	31 15 0
Deduct expenses.	30 7 0

Leaving a nett profit of £1 8 0

By these figures you see, I make a charge of 8s. per week for the last 11 weeks, for roots, meal, &c., not produced on the grazing lands; this I think only fair, in comparing her with a dairy cow, as by my system the latter does not consume artificials; on the other hand, I allow £1 for the rough keep left on the land, as the animal is stall-fed from the 3rd Oct. I also allow £1 for the manure, as having been eating oilcake, meal, &c., it must be of that value. Let us proceed to what I shall call a second-class grazer:—

Grazer bought the 1st February for.....	£9 0 0
Keep on hay, from 1st Feb. to 9th May, 14 weeks, at 4s.	2 16 0
At grass, from 9th May to 3rd October, 21 weeks, at 3s.	3 3 0
Attendance.	0 10 0
Risks from disease or death.	0 10 0
Eight months' interest on first outlay, at 5 per cent.	0 6 0

£16 5 0

Sold the 3rd October, call her 6 cwt., at 60s. £18 0 0
Allow for rough keep left on the land. 0 10 0

Deduct expenses.	18 10 0
	16 5 0

Leaving a nett profit £2 5 0

Or a balance of 17s. in favour of the animal entirely fed on grass, and disposed of early. We now come to the dairy cow, costing £18, to calve the 1st March:—

One year's interest on £13, at 5 per cent.	£0 18 0
Keep on hay, from 1st March to 10th May, 10 weeks at 4s.	2 0 0
At grass, from 10th May to 1st Nov., 25 weeks, at 5s.	3 15 0
Keep on hay, from 1st to 29th Nov., 4 weeks, at 4s.	0 16 0
Ditto, from 29th Nov. to 1st Mar., 13 weeks, at 2s.	1 6 0
Expense of attendance and dairy work	1 10 0
Wear and tear of dairy utensils	0 3 0
Loss on casualties and aged cows.	1 10 0

Total expense. 11 18 0

Let us now see what she produces:—

Calf sold at a fortnight old	£1 5 0
3 cwt. of cheese at 60s. per cwt.	9 0 0
37 weeks' butter, at 2s. per week.	3 14 0
Whey for pigs	1 0 0

14 19 0

Deduct expenses 11 18 0

Leaving a nett profit of. £3 1 0

By these calculations the dairy cow appears the more profitable animal, and with this I perfectly agree, when the farm lies compactly, and the wife or daughters of the farmer are able and willing to manage the dairy; but when the fields are at a distance from the homestead it may be prudent to try grazing, if the land be of sufficiently high quality for feeding purposes. On my own farm I have tried both systems, and am thoroughly convinced my dairy cows are per head a greater source of profit than my grazing beasts; and as I have before said, the acquisition of profit is the main object of all business, I decidedly think that object will be best obtained, on the majority of our Vale farms, by keeping a useful pack of dairy cows, provided they are well cared for, and the dairy managed on the best principles. Having made these few observations, I am quite willing to be corrected in any of them, as what we all want is, to arrive at the truth, and discussing the matter is the most likely way to bring that about. If I have in the remotest way given any of you a hint worth your notice, I am very well repaid for any little trouble I have taken, and do most heartily thank you for the kind way in which you have listened to my few imperfect remarks, and now beg to say, I shall be happy to answer any question that may be put me, if it lies in my power, and conclude by wishing you all a Merry Christmas and a prosperous New Year.

Mr. NICHOLLS opened the discussion by asking Mr. Savage if he considered the quantity of cheese he had stated to be made per cow, and the value of the same, to be an average yield and price; he himself believed both to be rather over the mark, and he thought that in discussions of this kind statements should extend over a series of years, rather than be confined to any one particular season, and it must be well known to all present that prices this year are considerably higher than they have been. He considered them at the maximum, consequently not a safe one by which to make calculations. He felt indebted to Mr. Savage for the manner in which he had brought the matter forward, and agreed with him that for the Vale (Berkeley), taking it generally, the dairy cow was the most profitable, for although he often heard it designated the rich Vale of Berkeley, there are many acres quite poor, and that would not fat a beast, or produce more than fifteen cwt. of hay per acre; and of which he was quite convinced three acres would not maintain a cow to yield three cwt. of cheese.

Mr. J. TILL said he thought Mr. Savage's statements, as regards the quantity and price of cheese, not at all extravagant; he was satisfied he had realized £3 per cwt., taking the average of the last seven years. Again, it must be

borne in mind, that the price of beef this season was also equally high, consequently if we took this present year it would not materially affect the subject under consideration. Taken as a whole, probably there were, however, one or two items with which he could not exactly agree. In the first place, what Mr. S. termed a second-class grazer, realizing £18 the beginning of October, could not be bought in the preceding February for £9. He thought £11 nearer the mark. Three acres of land was generally considered the quantity required for keeping a dairy cow twelve months, and Mr. J. Norton he believed put the cost at £9, both of which he thought high calculations. He was, however, decidedly of opinion the grazer might be maintained at less cost than the dairy cow; at the same time he doubted if it would make so good a return. There was another item which he could not agree to, that of 2s. per week for maintaining a dairy cow at hay, when dry for thirteen weeks, from November to March. He certainly could not keep his at that sum. He quite agreed with Mr. S. as to the means of success in any business. The two under discussion are of a very different character, and in a great measure depending totally on the different heads of the establishment for success, the dairy constantly requiring the attention and supervision of the female part, whilst successful grazing employs and requires the strictest attention, judgment, and foresight of the farmer.

Mr. HARRISON thought, from Mr. Savage's figures, the second-class grazer showed as good a return as the dairy cow, the grazer being on the farm only eight months instead of twelve, and if allowed the same extent of land, the grass left must be worth more than 10s. Again, 40s. per ton was generally considered the consuming price of a ton of hay, and most people agreed that stock would not realise more than that sum for feeding it. If so, he believed it would be better to consume it in grass, thus saving the expense (which was a heavy one) of haymaking. If three cwt. of cheese per cow per year was an average yield, he should say it was a small quantity, and went far to show what was often reiterated, that that progress in cheese-making and dairy management had not taken place as in other branches of agriculture; he, however, thought the day not far distant when the art of chemistry would point out to us how to make a larger quantity and of better quality. He coincided with the opinion expressed by Mr. Till that 2s. per week was not sufficient to maintain a dairy cow during the winter season, and believed it would add greatly to her profit to keep her better, and not allow her to be in idleness for so long a time as thirteen weeks. No doubt some of the land in what was termed the rich Vale of Berkeley was of a poor description, consequently not calculated for grazing, and many of the farms were also small, whilst at the same time it was celebrated for its excellent cheese; under these circumstances he should rather advocate dairying, although, in his opinion, sufficient had not yet been advanced to show decidedly which of the two was the most profitable. He must admit he had rather increased his dairy stock, to the diminishing of his grazing. He, however, recommended the feeding of the turned off cows.

Mr. O. LONG said doubtless much of the pasture of the Vale district, either from some peculiarity of the soil or the herbage, was naturally suited to the production of cheese; at the same time others were equally suited for the production of flesh. In fact, on some farms, both descriptions of land existed. Under these circumstances, he should advise the farmers to try both methods, and follow that for which by experience the land seemed most calculated. He was decidedly of opinion that a greater number of grazing cattle than dairy cows could be maintained on a like quantity of land, and so far as his ex-

perience went, and the farm was at all adapted, he should recommend both systems to be followed, as it would in some measure relieve the tedious and expensive haymaking, as also the indoor drudgery attending a large dairy.

Colonel N. KINGSCOTE, M.P., said he felt much interest in Mr. Savage's paper, and also in the discussion. He was rather surprised to find so strong a feeling in favour of dairying, as he should have thought the pastures in the Vale as well calculated for grazing as those in some of the midland counties, where grazing was followed to a considerable extent, and where the cattle was taken to the market fat from the grass. He, however, believed artificial food (either cake or corn) was given them along, as he had observed troughs in the fields; he also thought, from the general appearance of the neighbourhood and the farmers, that the system answered. Nevertheless he had been given to understand that more dairy cows had lately been kept, and that a feeling was arising in favour of a mixed stock. He thought if Mr. Savage could keep a cow on hay at 2s. per week, he must possess a much better system of managing than he did with his horses, or otherwise they must do with a considerably less quantity.

Mr. THOMAS said he was aware it was generally considered that a dairy cow required three acres of land for her winter and summer keep. He could not himself think she wanted so much. He could name many instances where a cow was kept to every three acres, with two or three horses or colts, and a small flock of sheep on the farm into the bargain. This he thought was often the case, without being at all taken into consideration; he doubted not, however, the dairy cow would consume more than either of the grazers Mr. Savage had mentioned, and had he allowed more than £1 and 10s. in the respective cases he should not have found fault. The manure left by grazing cattle would be better than from dry cows. He was himself in favour of the dairy cow, as most suited to the locality and size of the farms, and for which by nature the soil seemed best adapted.

Mr. BURNETT was decidedly of opinion that dairying was the most profitable, still he held with the plan of grazing out the barren cows. He thought three cwt. of cheese per cow was produced on the majority of farms, whilst some was under and others over; so on the whole he thought it a fair average as regards the value; if high, so was the price of beef; consequently, as Mr. Till had remarked, Mr. Savage's calculations would be about a par.

Mr. KING and Mr. ROBINSON were for a mixed stock, whilst several others who took part in the discussion were in favour of dairy farming.

Mr. SAVAGE, in reply, said he trusted Mr. Till had quite satisfied Mr. Nicholls with respect to the value he had set to the cheese. As regards the quantity made per cow (which would be what would most materially affect the result, under present prices, beef being in his opinion more above the average price than cheese), he believed it was not more than was made, taken in accordance with what he charged for the maintenance of the cow. No doubt there was a good deal of poor land in the Vale, and if the occupiers of such attempted to keep the same quantity of cows, they could not be expected to produce so good a return. As to the other items, they were in some instances quoted from *bona fide* transactions; in the others they were as near as his judgment dictated. With respect to the 2s. per week for hay, when the cow was not in milk, in his own case she was turned out by day into the rough pastures, for which perhaps he should have charged a little; but it must be borne in mind that 40s. per ton was considered a fair consuming price for hay, and that the cow at this time was kept on that of inferior quality. As to what he had

stated, a second-class grazer could be bought in at, at the present time they could be purchased at a less sum, and he generally found one at about that price (£9) pay better than those at a higher figure. Mr. S. then gave a statement of four which he purchased on the 1st of February last, and had just sold them for £29 each, and on going into figures they showed a loss of nearly £4 each. He did not mean to say this was always the case; but he certainly thought there was greater variation and more uncertainty as to the profit in grazing than in dairying, and was one reason why he was in favour of dairy farming.

The CHAIRMAN (Mr. Burnett) had listened with particular gratification to the several remarks that had been made. From what he had heard, it appeared to him the majority was in favour of dairy farming, and he must confess it was an opinion in which he himself coincided. Believing, as had been more than once intimated, that most of the pasture land of the district was more calculated for dairy purposes than for grazing, he thought sufficient importance had not been attached to the better quality of the manure left by the feeding cattle, and agreed with Mr. O. Long that it would be well to make a fair practical trial of the two systems; but it should be tried impartially and without prejudice, and extended to more than one season, and on more than one farm. As there seems to be some little difference of opinion, and that some decision may be arrived at, he would propose to them the following resolution:—

"That in consideration of a large portion of the pasture land of the district being more adapted for the production of cheese than for grazing, dairying is the most advantageous system to follow; but at the same time where a portion of the land is of a rich quality, it may be advisable to combine the two."

A vote of thanks was unanimously passed to Mr. Savage for his interesting paper.

TEVIOTDALE FARMERS' CLUB.—At the monthly meeting of this club on Jan. 31, the question, "What is the best mode a stock farmer can adopt to provide for his flock during such a season as 1860?" was considered. Mr. Aitchison, Linhope, who opened the discussion, after noticing at some length the great loss in hill stock throughout Scotland during the rigorous winter of 1860, gave it as his opinion that hay was the best supplementary food for sheep, because it left the animal in much better condition to return to the pastures than any other description of food. As it was necessary, however, that a large quantity should be in store to provide against the contingency of a severe winter, plots of ground to train for hay should be enclosed on the farms, and proper sheep houses and hecks for feeding erected. The old system of laying down the hay in handfals on the pasture ground was objectionable, as in stormy weather the wind scattered it abroad. The other members generally concurred in Mr. Aitchison's views. Mr. Walter Laing hoped the farmers would endeavour to get the landlords to do something in the way of providing the enclosures which had been recommended, as it was unreasonable that improvements by which both landlord and tenant benefited should be carried out entirely at the expense of the latter. Mr. Aitchison, in reply, said it was to be regretted that the proprietors of hill farms did so little towards their improvement. In the valleys, improvements were carried out on a liberal scale, and the cost of reclaiming forty acres of waste land would go far to make the most extensive sheep walks in the south of Scotland all that could be desired. The stock farmer was far more dependent on the elements than on the times, and his landlord was deeply concerned in placing him in such a position as to contend successfully with the severity of the weather.

THE FORTHCOMING TRIAL OF STEAM-CULTIVATORS.

THE LEEDS MEETING.

BY A PRACTICAL FARMER.

Amongst the many and highly satisfactory improvements adopted this year by the Royal Agricultural Society of England, is the one relative to the steam-plough and cultivator trials. There is much common-sense and practical business in it. I have often blushed to see the unbusiness-like manner of these trials. Upon land as hard as a flint, or, it may be, stiff and brittle as hard wax, or as adhesive and clung as gutta-percha, or, again, as wet and soft as mud, have these powerful implements been set to work for the purpose of testing their invaluable powers, and to prove their relative merits and qualifications; verily, there is a time for everything. I rejoice that at last we are likely to have a fair and proper trial at the ensuing Leeds Meeting, or in reality some few weeks prior to its commencement. Owing to the indefatigable exertions of "*Jno. Fowler*," the implement committee recommend that these trials take place in April, and upon an extent of land comprising about three hundred acres. Now, in this arrangement there is breadth, scope, and time enough for a good and correct trial; and I trust suitable land can be procured to test each competitive implement in all its adaptations.

For this purpose land of various kinds should be obtained, heavy land for heavy work, light land for lighter work; for we want steam-cultivation adapting to every kind of soil, from the most retentive waxy clay, to the light bowing sand, or fenny moorland. It is preposterous to cultivate light peaty land, or light gravelly soils, or sandy soils with Fowler's ponderous ploughs. We want to see the various inventions for cultivating by steam-power proved on every variety of soil that can be conveniently procured, so that each visitor shall have the opportunity of forming an opinion as to the preference for his own occupation; for, after all, this is the practical bearing of the whole trial. Judges are all very well, and exceedingly useful in their departments; but I, for instance, prefer seeing the work performed myself, and can then, better than any judge can tell me, decide which system or which implement is best adapted for cultivating my farm. This is the opinion of the majority of farmers, and therefore sufficient time and every publicity ought to be given as to the day and place of trial.

I am aware that some difficulty will arise here, because the evident meaning of these protracted and extensive trials is, that they shall be conducted when the land is in a proper state for working. The notice will therefore be somewhat indefinite, like the advertisements announcing the sailing of the good ship so-and-so, wind and tide permitting. However, the land does not either harden or soften in a day, so that a reasonable

notice can be depended upon, to be announced through the leading agricultural papers and local press, and one or two daily papers. Farmers will be on the look out, and will not fail to observe the notice as soon as out, whether it be to postpone the trial or noticing its progress. In this way the press is highly useful in diffusing information, so that the public, through the press, will quickly learn the state of the various trials, and where the different implements are at work.

As to the adjudications: The judges have not only to adjudicate the prizes, but they have to make a full and comprehensive report of all the proceedings; hence I consider it to be requisite for the judges to be present during the whole of the trials. Certainly, for their personal convenience, a day or two might intervene, to give them an opportunity of attending to their own concerns; but I conceive that during the time of the competitive trials they ought to be present. At the Chester Meeting, several of the judges were detained seven or eight days, and some of them were laboriously engaged from six o'clock in the morning till nine o'clock at night, testing thrashing-machines and other machinery. It is true, competent individuals might be engaged, to weigh coal, take time, note stoppages, measure work performed in a given time, and other matter, and leave the judges to decide upon the work done. I cannot conceive this would be satisfactory to the public; this work must of course be done, but it ought to be done under the especial supervision of the judges, who are alone responsible for the correct conduct of the trials, and the results. The judges must be not only competent, but industrious, and closely observant of every circumstance.

The Trials.—The Preliminary Arrangements: It will be necessary for the Society to provide a friction break and two dynamometers; one of the latter to test the power required to draw the rope and pulleys separately, and the other should possess sufficient strength to test the draught of the most powerful steam-plough or cultivator. I have the pleasure to know that such a one can now be procured. Mr. Bental, to whom agriculturists are already much indebted, has constructed one of great capacity, registering a draught of four tons, which surely will be test enough for any reasonable work. The friction break would of course be required to test the engines before starting. This done, the next thing is the work to be performed. Well, what does a farmer require to be done? Common ploughing, deep ploughing, subsoil ploughing, trench ploughing, and ridge work or ploughing. He also requires his stubble land to be "smashed up," as Mr. Smith calls it, and subsequently well working by cross-scarifying or cultivating,

so as to reduce it to a state best adapted for harrowing and the required seed-bed. Now, in all this there is much to be done, and much to arrange; so that, in fact, the judges ought to be immediately selected, and, together with the field stewards, should meet to discuss every point, and decide upon the best course to be pursued.

It will be observed that the Society offers two prizes of £100 each: 1st, for the best application of steam-power to the cultivation of the soil; and then, ditto ditto, worked by an ordinary portable engine not exceeding 10-horse power. What is an ordinary portable engine, I ask? Who is to answer me—*i. e.*, who is to decide what is an ordinary portable engine? "Jno. Fowler" brings into the field an ordinary portable engine, from which he removes the travelling wheels, without other alteration, on to a windlass, which he drives with a strap from the fly-wheel. Is this to come under the same denomination as Mr. Edington's, who runs his engine on to his windlass with the travelling wheels on? Again, Chandler and Oliver bring a portable engine with its crank shaft lengthened to receive spur pinions, and its axletree lengthened to receive two winding drums. Is this to come in the latter class with Smith's, who merely puts on his strap? I can imagine a distinction to exist between the permanent attachment of the working parts to the engine, and in their temporary adjustment; but this wants well defining, or objections will arise of which exhibitors may take advantage. Well, these matters settled before we begin, the coals weighed, and given to the respective competitors,

each takes his place in the field appointed for ploughing, and common ploughing is the first commencement. The land being measured, the time noted, and the word given, they start at some convenient time, and when, in the opinion of the judges, all parties are working at a corresponding depth and in similar soil, the dynamometer shall be applied (taking care that the time lost in this hindrance shall be noted), and the respective draughts taken. This, with the quality of the work performed and coal consumed, will form the main basis for adjudication. The same course must be followed for deep-ploughing, subsoil ploughing, and cultivating; but with trench work or ridge work it might be dispensed with. In cultivating—*i. e.*, "smashing up"—it is important that the draught should be taken, however difficult it may be, from the irregular working of the implements. This expenditure of power has not yet been arrived at, and would be one of the good results of the Leeds meeting. The rotary cultivators may cause some perplexity. Their draughts cannot be taken, but some fair approximation may be obtained from the coal consumed; the power of the engine being known, the work done will decide the point to a great measure, although it may not appear what proportion of the power is expended in propelling the engine over the land; be that as it may, the judges may estimate the economy of performance by the value of the work done. I would only now further observe that it would be very desirable to select some of the most efficient steam-ploughs and cultivators for exhibition in work on the show week, and at the cost of the Society.

THE POSITION AND RESOURCES OF THE SLAVE STATES.

The disunion movement in the North American States is one which, irrespective of its great political importance as respects the wellbeing of a powerful maritime and commercial State, is also of high interest to the commerce and manufactures of Great Britain. The breach seems to widen rather than to close, as time steals on, and the measure of secession will doubtless be persisted in by South Carolina. This will aggregate around her banner most of the slave and border States. South Carolina has published her programme of operations, and her reasons for withdrawing from the confederation. With the validity or point of these arguments we shall not deal, preferring to look at the matter in its future agricultural and commercial bearings, rather than in its present troubled state.

According to the American advices Georgia would appear to be in arms already; and Alabama, Mississippi, Louisiana, and Texas, with the more northern of the Southern confederacy, are ready to join in the first flush of victory or of decisive action on the part of the Palmetto State. Virginia, it is expected, will also follow. Secession State conventions were announced to be held about the middle of January, in Florida, Alabama, Mississippi,

Texas, Georgia, and Louisiana. The Legislature of North Carolina is now in session, and special sessions of the Legislatures of Virginia and Tennessee were called to meet on the 7th January, while Missouri will also take the same course; the Governor in his opening address having pronounced that Missouri must stand by the other slaveholding States, whatever course they may pursue, the interests of all being identical. Let us at least hope that if these differences between the North and South cannot be amicably adjusted, that there may be at least a bloodless revolution, and that the hot spirits of our brethren across the water may not embroil them in riots and hostilities, attended with contests by force of arms, the ultimate consequences of which may be frightful to contemplate.

The whole question of separation and independence for the South is attended, it is true, with many difficulties, territorial, fiscal, and commercial. The balance of power as regards area, population, representative legislation, and taxation, has long been a vexed point. The separation if persisted in may, however, materially retard the onward progress of the Union. The North and the South are, however, mutually dependent upon each other. The manufactures of the Northern States cannot be kept up without the cotton of the South.

Sugar, tobacco, and other products are also mainly drawn from the South; while most of the European and other supplies are received through the Northern ports. The disruption occurs at a most inauspicious time for the Federal Government, whose finances are deranged, and its credit not of the best, although its debt is trivial and its resources ample. Still any withdrawal of Customs revenue and other taxes, will prove injurious; and with present difficulty in placing even its treasury bonds, any loans for war purposes, in increasing naval and military forces, would be still more injurious.

Resuming the statistical inquiries we lately commenced, we find that the fifteen slave States comprise a population, according to the latest accounts, of upwards of 12,000,000, being an increase since 1840 of nearly 5,000,000, and of these nearly 4,000,000 are slaves. The whole of the Republic contains an area of nearly 3,000,000 square miles, of which Louisiana, Florida, and Texas alone make up nearly half. The entire population, of which a census has recently been taken, probably amounts now to 36,000,000, or an increase of more than one-third since the last decennial census. The revenue last year of the Republic was £16,200,000, and the national debt about £12,000,000 but the States individually have also absolute debts amounting to £39,000,000, and contingent debts to £11,500,000; of these debts the slave States owe about £23,000,000; Virginia, Maryland, North and South Carolina, Louisiana, Alabama, and Tennessee have the largest liabilities.

The slave States possess the two large seaports of New Orleans and Baltimore; and another great town, St. Louis, is rapidly springing up on the Mississippi. New Orleans has a population of about 150,000, Baltimore 210,000, St. Louis 100,000, Charleston 41,000, and Mobile 21,000.

There is one fact which requires to be noticed, and that is—the rapid natural increase of the slaves, without any aid from immigration or foreign slave traffic, which is in striking contrast to the almost stationary condition of the free negroes. This furnishes, it is true, no moral justification of the institution of slavery, but it does give a decided denial to the stories of general cruelty and degradation among the slaves, for no race could thrive and multiply thus steadily and rapidly under a general system of cruelty. The number of slaves in 1830 were 2,000,000, in 1850 a little over 3,000,000, and is now estimated to be nearly 4,000,000.

The ratio of decennial increase of the free negro population has materially declined in the northern States; but there has been and continues to be a steady increase among this class in the slave States, and this in spite of the civil and social disabilities and the antagonism of races, which is more marked there than at the North. Although each of the slave States has laws forbidding absolutely the introduction of free negroes from other States, their numbers multiply there in a ratio exceeding that of most of the free States, which are the refuge of fugitives, and whose laws are the

most indulgent to the coloured race. The free negroes are now more numerous in the slave than in the free States—a result not to be easily credited or comprehended, when we think of the opposite institutions and tastes that exist in the two divisions of the Confederacy. It must be referred partly to the more favourable climate of the South, and partly to a natural inclination in a portion of the race to submit to the degraded condition of their ancestors rather than undergo the hazards so often attendant upon higher civil standing in the more Northern States.

The business in the slave ports hitherto has been chiefly in exporting produce, their imports being comparatively small. The following shows the proportionate value of imports and exports in round numbers:—

	1851.	1853.
Imports—Free States . . .	£40,000,000	£50,250,000
Imports—Slave States . . .	5,000,000	6,300,000
Exports—Free States . . .	22,400,000	33,000,000
Exports—Slave States . . .	23,000,000	32,000,000

Taking the returns of the year 1850, for comparison, we find that the following were the agricultural products of each division:—

	SLAVE.	FREE.
Improved land, square } miles	84,332	89,191
Wool, tons	5,580	17,735
Hay „	1,117,470	12,470,819
Butter „	29,205	109,007
Cheese „	579	45,411
Wheat, qrs.	3,908,205	9,107,567
Indian-corn, qrs.	42,930,357	30,234,005
Hemp, tons	67,254	7,987
Tobacco „	82,443	6,605
Cotton „	431,834	—
Sugar „	143,741	13,717

The quantity of rice grown was about 37,000 tons. The Indian-corn crop, chiefly centring in the Southern and Western States, is a greater and more valuable staple than cotton. The cotton may be worth £25,000,000 to £30,000,000; but the maize crop is worth £60,000,000 or more than double, and of this about £12,000,000 is annually exported. In Western Virginia, Ohio, Kentucky, Tennessee, Indiana, Illinois, and Missouri, there were raised in 1850 about 350 million bushels, or nearly two-thirds of the whole amount grown in the States, and last year probably about 500 million bushels.

In 1851 the value of the productions of the Southern States was about £33,000,000, of which cotton stood for £27,660,000, sugar for £3,100,000, tobacco about £2,000,000, rice £400,000, and naval stores (that is wood, turpentine, &c.) £200,000. The last three items are the exports only, and not the whole production, of which there is no accurate record. Our chief purpose in placing these few figures before our readers is to diffuse authentic information as to the position and resources of the Slave States, with which British commerce and manufactures are so closely identified.

AGRICULTURAL PROSPECTS IN AUSTRALIA.

Of the various British colonies there are none in which we are more specially interested than in the Australian settlements. As the gold produce of Victoria declines, it is at least satisfactory to find that the agricultural products increase. A greater degree of attention is now being given to all that relates to the culture of the soil and the increase of live stock. It is interesting to watch the statistical advances made by this important southern colony in the more permanent elements of wealth. Every year sees one or two thousand more occupiers of land. In the three years ending with 1859, 4,300,000 acres were sold or granted, and with the immense territory of crown lands unalienated there is yet ample space for extension. The Colonial Office returns only extend to 1858, but we have private returns from the colony for 1859.

In 1857, 786,790 acres of land were sold, and 370 granted; the average price per acre was £2 2s. 7d. In 1858, 3,042,514 acres were sold, at an average of about £2 10s., and 439 acres were granted. In 1859, 127,074 acres were sold in lots under 100 acres, 309,205 in lots under 500 acres, and 22,721 in lots over 500 acres. The total sold during the year was 459,081 acres, and by grant 122 acres, for a sum of £814,163, or an average of 35s. 5d. per acre. The total extent of the unalienated land in the colony last year was 52,142,010 acres. The number of the agricultural holdings exceeding one acre was 13,175, embracing 3,015,607 acres, of which 358,727 were cultivated, and 2,048,092 enclosed. There were 107,092 acres of wheat, 90,167 of oats, 4,101 of barley, 738 of maize, 149 of rye and bere, 395 of peas, sorghum, beans, and millet, 27,622 of potatoes, 220 of turnips, 112 of cabbages, 98,164 under hay, &c. The total produce of the year was as follows:—Wheat, 2,296,157 bushels; oats, 2,553,637; barley, 98,433; maize, 7,374; rye, 2,692; peas, &c., 5,589; potatoes, 48,967 tons; turnips, 673; mangold wurtzel, 4,645; beet, 25; carrots and parsnips, 718; cabbage, 355; hay (of cereals), 135,246 tons; rye, &c., 396; onions, 1,029 cwt.; tobacco, 463 cwt. Number of vines, 1,896,939; fruit sold, 4,473 cwt.; wine produced, 13,966 gallons; brandy manufactured, 150 gallons. The total number of horses in March, 1859, was 69,288; horned cattle, 683,534; pigs, 50,965; and sheep, 5,794,127. In the year, however, 123,169 cattle, 415,939 sheep, and 4,446 horses were imported.

There is a steady if not a very rapid increase in the live stock of the colony which is at least satisfactory. One thing, however, surprises us; and that is the decline in the annual number of stock slaughtered, notwithstanding the increase of population. For instance, in 1857, there were slaughtered 176,747 cattle, 998,824 sheep, and 25,249 pigs. In 1859, the numbers were, 165,730 cattle, 745,457 sheep, and 26,505 pigs. Probably this arises from imperfect returns.

Passing next to the mortgages recorded on land and live stock, we find 3,137 recorded, for a total amount of £2,093,609—about £600,000 below the previous year. Of these, 1,701 mortgages, for sums amounting to £858,896, applied to town lands, and 1,325 deeds, for £1,030,524, to country lands, and 111 mortgages, for £204,188, to mixed town and country lands. 87 “liens” on the wool of 1,109,684 sheep, for £994,273, were granted; and 182 mortgages, affecting 897,386 sheep, 134,593 cattle, and 2,496 horses, for a value of £1,002,297, were recorded.

The population of the colony on the 31st December, 1859, was 530,262 souls, being a net increase during the year of 25,743. In the year, 30,583 persons arrived, and 19,418 departed by sea. Of the total increase by immigration, 4,657 were males, and 6,508 females. Of these, 3,151 (including 2,559 females) were assisted, and 27,432 unassisted; 2,152 Chinese came in overland from the neighbouring colonies, and 197 went out of the colony. On the gold fields there were in all 201,422 souls—namely, 113,194 men, 27,014 women, 35,170 children, and 26,038 Chinese men. The gold exports have been gradually declining here as in California. In 1856, £11,943,458 were shipped; in 1859, £9,122,037. Dividing this among the persons on the gold fields, it would scarcely average £45 per head per annum, a sum utterly insufficient to pay current expenses of living. The agricultural produce for consumption and export is, however, steadily increasing, although the gold decreases. Thus, the wool export alone forms a total of about 22,000,000 lbs., worth £1,750,000. The chief imports of the year were valued as follows: agricultural implements £38,588, apparel £588,654, powder £34,547, bags and sacks £98,375, bottled beer £269,327, draught ditto £395,292, books £73,839, boots and shoes £607,703, bran £60,579, brushes £20,215, building materials £57,609, butter £480,258, candles £215,796, carriages, carts, &c. £61,686, cheese £115,621, coal £191,576, cordage £59,246, cottons £232,041, drapery £1,384,935, drugs £98,409, earthenware £47,869, fancy goods £51,574, preserved fish £57,659, salted ditto £54,434, flour £720,660, furniture £95,490, barley £18,759, beans and peas £13,001, maize £85,083, malt £96,164, oats £447,832, rice £324,627, wheat £208,678, haberdashery £115,985, hardware £311,438, hats and caps £86,153, hops £34,561, hosiery £82,869, musical instruments £36,027, iron £269,084, leather £10,481, linens £36,803, horned cattle £94,150, horses £83,235, sheep £27,647, a tiger £100, an ourangoutang £15, camels £600, machinery £213,334, matches £26,379, millinery £69,634, nails and screws £67,733, paintings and engravings £9,120, preserves £44,113, hams £88,451, railway materials £95,830, saddlery £42,446, silks £119,330, stationery £174,796, &c. Amongst the

exports were the following items: bark £1,310, black sand £6,930, boats £1,094, bones £5,135, boots and shoes (mainly to New South Wales) £37,269, building materials £11,501, candles £6,610, copper £34,385, glue pieces £1,259, gold £0,122,037, guano £2,923, gum £900, hides £135,650, horns and hoofs £7,202, jewellery £3,473, leather £10,316, horned stock £55,902, horses £77,053, sheep £25,799, specie £1,304,992, silver £889, specimens of natural history £2,443. Total value of the imports £15,622,891, of which £10,263,468 was for British and £3,242,325 colonial goods. The exports were valued at a total of £13,867,859, of which £11,282,319 represented the produce of Victoria; from Great Britain imports were received worth £9,176,528, and exports sent worth £10,542,849.

Manufactories of different kinds are springing up in the colony. Thus there are 59 saw-mills, 31 tanneries, 20 fellmongeries, 48 coach factories, 2 tobacco manufactories, 41 agricultural implement makers, 22 machinists, 3 bone-manure works, 46 breweries, 11 wine-presses, 1 distillery, 6 biscuit manufactories, 18 soap and candle works, and 97 flour-mills, of which 81 were worked by steam, 14 by water, and 2 by wind and horse power. On the gold fields there were 503 steam engines, 6,447 puddling machines, and 144 quartz-crushing machines.

The revenue of the colony approximates to £3,000,000 a year, and of this large sums are being dispensed for public works, railways, Government buildings, &c.

The Houses of Parliament are estimated to cost £400,060, a Custom House £93,000, a Treasury, executive offices, post-office, lunatic asylum, and museum to cost in the aggregate £384,000. All, however, is not expenditure. There is some thrift among the colonists, for there were 8,854 depositors in savings banks, with £468,778 at their credit, or nearly £53 to each. The average paper currency in circulation was nearly £2,000,000. The amount in coin is not stated.

Ship-building even occupies some degree of attention, although the coasting and general carrying trade is conducted in vessels owned out of the colony. In 1858 there were 6 vessels built of 178 tons, and 48 of 6,285 tons, added to those registered in the colony. In 1859 a small steamer of 18 tons was built in the colony, and 3 coasters; 47 new vessels of 8,541 tons were also registered in Melbourne.

Looking at the general features of the colony—agricultural and commercial—there is every element for successful progress if speculation be avoided, and agriculture and pastoral operations be more steadily attended to. The gold fields have been so far beneficial that they have drawn public attention and immigrants to the colony. But their yield is shown to be unreliable, while agricultural produce is certain. The lesson will not, we trust, be read in vain to the colonists, who have hitherto too much neglected hay, corn, and wool, for the yellow metal won by such hard toil and at such sacrifice of every personal comfort.

STAINDROP PLOUGHING MATCH.

The thirteenth annual ploughing match, in connection with the Staindrop Farmers' Club, came off on Tuesday, Jan. 28 (having been postponed from the Tuesday previous, in consequence of unfavourable weather) in a clover-ley belonging to Thomas Sutton, Esq., of Alwent Farm, which is situated close by the Darlington and Barnardcastle Railway, about midway between Staindrop and Winstone. Although highly successful in every other respect, and well calculated to give encouragement to the promoters, the entries were not so numerous as on former occasions: this year there were only thirteen entries—six for wheel ploughs, and seven for swing ploughs; last year there were twenty-one. The falling-off was doubtless owing, indirectly, to that which almost every ill-success in agriculture has during the past year been ascribed—namely, the weather; not that there was any lack of fine weather on this particular day, for the sun shone resplendently, but that farmers, having been thrown considerably backward by the lengthened and excessive frost—nowhere perhaps felt more keenly than in this neighbourhood—are now exceedingly busy, making the most of the open weather, which for the past fortnight or three weeks has prevailed; and under these circumstances they are loath to part, even for a single day, with any of their men, and more especially with their best men, who are the

only persons that can hope to win in a competition which, as regards the Staindrop match, comprises generally the picked ploughmen of the country for miles round. The ground was not in the best trim possible, being hard trodden; but still it furnished a fair test of the competitors' individual skill. For wheel-ploughs, it perhaps could not have been better; but for swing-ploughs the work was very heavy. The soil, of a strong nature, and not sufficiently acted upon by the frost, fell not so freely from the mould-board as could have been wished. The ploughing was six inches deep by nine inches broad. The teams were only equalled by the ploughmen—strong and heavy, and in excellent condition.

There was a somewhat large and respectable company on the ground. The judges were Mr. Wm. Raine, of Morton Tinnmouth; and Mr. Wm. Trotter, Sledgwick. Their awards were—Wheel-ploughs: to John Duck, servant to Mr. Bulman, West Auckland, first prize, £2; second, £1, John Dent, Streatham; third, 10s., Joseph Harrison, with Christopher Craddock, Esq., Hartforth. Swing-ploughs: First, £2, Joseph Hugginson, with Mr. A. M'Kenzie, Arlow Banks, Barnard Castle; second, £1, Wm. Kipling, with Mr. Samuel Nelson, Scaife House; third, 10s., George Patterson, with Mr. Balman, West Auckland.

STRAW AS AN ADJUNCT IN FEEDING STOCK.

Straw when used as food must be considered an *imperfect food*. It does not contain, within the quantity which an animal can consume, enough nutriment to promote growth—indeed scarcely enough to support the animal from loss. It needs some addition to make it a suitable food for stock; and thus, although a ton contains £2 worth of nutritive matter, still we must combine with it stronger food to make it of real value. Fodder which is insufficient for its duty is a very expensive food when used alone; for the material of the animal has to make up the deficiency, which is a costly substitute; and when the loss is charged against the food, it materially reduces its value. We must not take a wrong impression, and consider straw to be worth £2 per ton, however it may be employed. When used as the only food for the animal's support, it is attended by a loss which reduces its value to a very small amount, and it no longer stands at its original value of £2 per ton. If straw were able to develop its own powers so as always to produce £2 worth of benefit, then we should be justified in taking it at such an estimate; but so long as its action is incomplete, and the deficiency has to be made up by some substitute, *the cost at which it is rendered complete* must be considered in its influence on the value of straw. Take, for example, food of similar bulky character, but of higher nutritive power—such as *good hay*. Here we have a body capable of doing its own work without help, and therefore we never find it looked upon as valueless for food; but this is entirely to be traced to the fact that the animal feeding upon it can gain enough, (under ordinary circumstances), to support the body from loss, and often add to its weight. If we can artificially bring straw to the same position, by an increase of its nutritious properties, so that an animal can consume enough for the purposes of life, then its position is very different; but it is desirable to see by what addition and at what cost we can add nutriment to straw so as to raise its feeding powers to an economical degree. Here we should find some organic analyses of different kinds of hay very useful, but we have only scattered information as to its composition. A valuable series of organic analyses upon Natural and Artificial Grasses has been carried out by Prof. Way, and published by the Journal of the Royal Agricultural Society, vol. xiv.; but we very much want a corresponding series upon hay. From the best information we now possess, we may consider that good average quality hay would contain—

8.5 per cent. of protein or albuminous compounds.
3. " " oil.
20. " " dextrin and starch.

Superior samples would probably range higher than this; whilst inferior quality would correspond with straw, and in some cases be of inferior composition. Mr. Horsfall has employed a compound for cows in

which straw forms a prominent constituent. The daily allowance for each cow is—

20 lbs. straw chaff.
3 " hay.
5 " rape cake.
2 " bean meal.
0½ " bran.
3½ " malt-combs.
35 " mangel-wurzel.

This has succeeded very well indeed, and it is as good an instance as any to examine further. Let us take the materials mixed with 100lbs. of straw :

	Albu- men.	Fatty Matter.	Dextrin, &c.
lbs.	Per cent.	Per cent.	Per cent.
10 bean meal contains ..	2.33	.3	4.65
4 bran ..	.78	.2	.0
4 malt-combs. ..	.03	.04	.4
100 straw ..	3.5	.81	9.16
	6.64	1.28	14.21
75 lbs. hay contains ..	6.38	2.25	15.

Thus, by adding the bran, malt dust, and bean meal to 100lbs. of straw, we have its nutritive value increased equal to 75lbs. of hay. But Mr. Horsfall also allows 40lbs. of hay, 25lbs. of cake, and 125lbs. of mangel-wurzel. We may therefore consider that equal nutritive matter would be given to each cow in five days by either of the following allowances of food :

lbs.	lbs.
100 straw ..	75 hay.
4 bran ..	
4 malt-combs ..	
10 bean meal ..	
40 hay	40 hay.
25 cake	25 cake.
125 mangel-wurzel	125 mangel-wurzel.

Either of these would be productive of rich milk and an increase of flesh. The cost at which this increase of nutriment (which rendered 100lbs. of straw equal to 75lbs. of hay) has been attained, is about 15d. :

	s.	d.
The value of 75lbs. of hay at £4 per ton ..	2	8
Deduct cost of materials added to straw ..	1	3
	It leaves	1 5
As the original value of 100lbs. of straw,		
or about 30s. per ton.		

It appears from this that, if straw is to be enriched by this process so as to be made equal to hay, the cost is so great that it reduces the original value of straw to about 30s., as compared with good hay at £4 per ton. This confirms the prevailing opinion that the two stand in this relation; and their usual sale prices are about in this proportion. So long therefore as good hay can be had at £4 per ton, straw cannot stand above 30s. in comparative value with it, because the cost of raising the straw to the quality of hay equals the difference between these prices. This gives another

illustration of a fact which has been already more fully shown—that the *average* sale price of different kinds of food approximates very closely to their relative feeding value.

It may be very reasonably inquired, how it is that straw now appears worth only 30s., whereas it was before shown to contain food worth 40s. per ton. This requires us to state that the 30s. only shows the relative value as compared with hay *at*—let us still assume—*four pounds*; but the fact is, good hay contains matter worth more than £4 per ton; although, as it forms one of the standard supplies of food (and is not a supplemental), it has to bear the loss which is occasioned in the support of life. It may be desirable to repeat here, that a distinction must be drawn between the *main supply of food* which the animal receives, and that which is simply a *supplemental food*.

Suppose, for instance, an animal to be fed entirely upon hay: a certain proportion of this goes to support the body in health, and the residue is added to its weight; but if we supplement this main supply of food by an allowance of corn or cake, the latter has no loss to bear—the tax has been paid by the hay; consequently the *whole of the supplemental supply is available* to the animal for growth, *but only a portion of the hay*. This affects the accepted value of every food which forms the standard supply of nourishment; and for this reason grass, fodder, roots, or hay are *not of a productive value equal to the nutriment they contain*; but cake and corn have not this loss to detract from their value, unless they are used with food such as straw, which, being incompetent to support the animal, needs their assistance. The same circumstances which affect the value of grass, fodder, roots, and hay, and cause them to be erroneously estimated at a less

value than the nutriment they contain would lead us to expect, equally influence the value of straw as food. If it is therefore no contradiction to say, that although superior quality straw contains 40s. worth of nutriment per ton, that its practical value is seldom equal to this. So far as the feeder is concerned, it is to a certain extent immaterial whether he allows the straw or any other food to pay this tax, for it must be discharged before any other duty is performed; and if there is not matter in the food to do it, the body (so long as it is able) surrenders the residue. But, when once this demand has been met, the food remaining is free for other purposes.

Notwithstanding the foregoing conclusion, straw still has a certain value, and this may be taken advantage of. The consumption of a given quantity of artificial food being decided upon—it may be, for adding to the fertility of the land, or for keeping a larger quantity of live stock, in consequence of a deficient supply of roots, or for any other purpose—it is important to consume it as economically as possible. This will be favoured by employing a bulky food in conjunction with it; and the question arises, What food is most suitable for this purpose? Hay is preferable to straw, and more economical; but in the absence of hay, or an insufficient supply of it, straw may be the *substitute for it*, wholly or in part. In such a case, the artificial food will be benefited by the bulky character of the straw, and also by the 40s. worth of nutriment it contains. Bulk might be given to the artificial food by a body destitute of nutriment, and it would thereby be assisted in its assimilation by the animal. When straw, however, not only supplies bulk *but also nutriment*, its value is increased accordingly. Hence, if *artificial food has to be consumed*, the straw judiciously used in combination with it must be valued at its full amount of 40s. per ton.

A REMEDY FOR THE POTATO DISEASE.

The following letter to the editor of a Bristol paper is worthy of notice:

"I beg to draw the attention of the public to one of the most effectual remedies for the preservation of the potato from the annual visitation of the disease. In all affected potatoes, even before the disease is visible to the naked eye, there is to be found a degree of moisture very far in excess of that to be met with in sound potatoes; and this watery principle gradually increases until the disease itself makes its appearance, when the character of the potato is changed; and the transition from comparative soundness to complete rotteness is sometimes the work of a day, but oftener the doings of an hour. Cultivators are indebted to Professor Bollman, of St. Petersburg, for the accidental discovery of a remedy, which has been found to answer so well in Russia, that on many estates drying houses have been built for the purpose of carrying out the experiment; and as it has been in operation in that country since 1853; it has, consequently, undergone seven years' trial. In the autumn of 1855, Professor Bollman received from a friend—a colonel in the Russian army, stationed in Siberia—a sample of a new potato,

with which he received two recommendations—namely, good in quality, and a perfect hundredfold in produce. These potatoes were accidentally placed on the back of a stove used for heating the Professor's study, where, by some mischance, they were forgotten till the planting season arrived. When discovered, they were shrivelled so much, that fears were entertained they would not grow at all. However, the potatoes were planted, and flourished to such a degree, that the two recommendations before mentioned were pronounced to be verified; and what was more remarkable still, although all the potatoes in the neighbourhood, and throughout the country, were more or less affected by disease, every potato of the new kind was entirely free from the disorder. This induced the Professor to adopt the expedient of drying; and, in consequence, the entire produce was submitted (after being dug) to a high temperature, which had the effect of charring some of the potatoes, and shrivelling the rest. It was surmised, at the time, that some of the charred potatoes were killed. They were, nevertheless, planted at the proper season; and the charred potatoes grew, and did quite as well as those potatoes which were merely shri-

velled. The year 1855 also proved that, although the disease was generally distributed throughout the country, not one of the Professor's new potatoes was affected by it in the least. The experiment was again repeated in 1856; and the crop exhibited the same freedom from disease. The kinds mostly in cultivation were then operated on—sorts which were yearly more or less affected by the disease—still with the same result. The digging-time of 1857 produced a splendid crop of potatoes. Upwards of three acres were planted with kilndried potatoes; and, although the produce exceeded 1,600 bushels, not a diseased potato was discovered. In 1858, Professor Bollman erected a drying-house, with heated floors, on his estate; and within the past two years, similar erections have taken place on the different estates of the principal landed proprietors. It is gratifying to find that the action of the

shrivelling process on potatoes already diseased arrests the progress of the infection, and kills the disease, thus leaving a portion of the potato sound enough to be eligible for spring planting. It has been stated that by the constant raising new varieties from seed, for planting, the disease may be considerably diminished; and this proved to be the case with the Fluke Kidney; for the first two years after it was introduced, and even after its cultivation had become pretty general, this famous kidney had not been attacked by disease; but last year the Fluke had been in some instances as badly diseased as the Fortyfold, Regents, &c.; so that the process of kilndrying promises far greater advantages and more certain results than all the expedients put together, which have been from time to time offered for the consideration of the public.

"I am, Sir, your obedient servant, "R. MILES."

LONDON, OR CENTRAL FARMERS' CLUB.

AGRICULTURE: ITS PAST, PRESENT, AND FUTURE.

The first Meeting for discussion in the present year took place on Monday, February 11, at the Club-house, Blackfriars, the new Chairman, Mr. Skelton, presiding. There was a very numerous attendance of members. The subject appointed for discussion—entrusted for its introduction to Alderman Mechi—was, "The Past, Present, and Future of British Agriculture."

The CHAIRMAN, in opening the proceedings, said he felt that some apology was due from him for his appearance that evening in such an important position; but he hoped that, with the kind support of the members, he should be enabled to promote the interest of the Club, and to preside over its meetings in a satisfactory manner (cheers). When he considered that that Club represented one of the greatest interests in the State—nay, in the world, namely, that of the cultivation of the soil, he felt that it ought not merely to maintain its present importance, but greatly to increase in numbers and influence (Hear, hear). The numbers had, indeed, considerably increased of late; but a list of five or six hundred was, after all, a very limited representation of such a body as the cultivators of the soil. He hoped they would, each and all, make an effort to increase the list, and that before that day month they would if possible place a name in the hands of the Secretary. One reason why they should make that effort was, that they were about to change either their landlord or their place of meeting; and he trusted that some arrangement would be made which would be satisfactory to the members generally. On the card containing the list of subjects of discussion for the present year there was one subject to which no name was attached. He was happy to say that, in committee that day, a gentleman had been named to introduce it. He had now the pleasure of introducing to them an old Member of the Club, Mr. Mechi, who took considerable interest in everything connected with agriculture.

Alderman MECHE then read the following paper "On the Past, Present, and Future of British Agriculture":—

B.C. to A.D. 450.—If this country were without towns cities, or roads, trade, commerce, or manufactures, and if the population were, consequently, solely agricultural, it would evidently be unnecessary to produce more corn or meat than would supply their own families, their lords,

warriors, governors, clergy, and dependants. Pasture, wood, and waste would abound; and, as there would be no use for money, the proprietors of land would receive for their almost worthless acres, personal services or a portion of the produce. Such was, in fact, the condition of Britain when, 55 years B.C., the Romans under Julius Cæsar landed in Kent, and ultimately conquered nearly the whole of South and Mid Britain, which they colonized and partially civilized, giving to the natives municipal institutions—a pretty good proof that in South and Mid Britain we were not so savage and barbarous a race as has been by some represented. It is true that the North Britons were more fierce, barbarous, and warlike than those of the South; and that our cannie friends over the border were then, as now, determined to come South in search of the "loaves and fishes;" for, in spite of high walls and fortresses, the Romans could only partially check the inroads of the Picts and Scots. The Britons of that remote period were evidently agriculturists, having herds and flocks; and also, in the Southern districts, growing corn, the roofs of their wooden houses being thatched with straw. They also made hay, for the wheels of their war-chariots had scythe blades attached to them; and having chariots, they must have understood making wheels. Although we have no authentic records before the time of the Romans, there is sufficient evidence to show that Britain had for many centuries carried on a trade with the Phœnicians, who coveted the produce of her mines; and, in fact, the Belgians had partially colonised the South-eastern coast. No doubt the agriculturists of that day had their Webbs, Bakewells, and Collings; but they had no oilcake, turnips, or clover to carry them through the winter. Having no Manchester manufacturers as their customers or suppliers, the Ancient Britons depended principally upon nature for their clothing, in the shape of furs and skins obtained by their skill as hunters in the extensive forests and coppices, or from the skins of their sheep and goats. Probably their nobles or Druids in the Southern districts were clad in felted-cloth. They grew woad, and used it for staining their bodies. The Britons appear to have been a noble and finely developed race, as might naturally be expected from their happy climate and fertile soil; and it can be no flat-

tery to our British women to say that their personal charms and virtues have, from the earliest recorded period, exercised a most salutary influence on our race and welfare, for we find every powerful nation, from the Romans to the Normans, intermarrying with our British women; and we have no record of the introduction of foreign women into this happy country. Strangely enough, I might quote my own case in proof of my argument, for my father was a Roman, and my grandfather a Saxon—my mother and grandmother being both English. One thousand five hundred years ago, Britain had possessed for more than three centuries nearly the whole of the Roman civilization, such as personal security—and, after payment of Roman taxes, security of property—arts and letters, elegant and commodious buildings, and roads to which no roads they have had since can bear comparison, except our present railways. It is easy to imagine that under such circumstances, and with the instruction and encouragement imparted by Roman civilization, British agriculture improved and flourished, and not only supplied its own inhabitants, but exported corn to Rome. The Romans were compelled by their domestic troubles finally to abandon Britain, A.D. 449.

449 to 1066.—*Now Commenced the Dark or Middle Age.*—The Picts and Scots ravaged the South country, and the divided Britons, unable to cope with their fierce and barbarous enemies, called to their aid the Saxons. These wild, warlike, and pagan people liked the country so well that they speedily sent for their countrymen, and eventually became masters of Britain; having, however, to sustain frequent and bloody wars with the piratical Danes, who occasionally overran portions of the country. Agriculture thus fared badly for several centuries, and we can easily believe Adam Smith, who says, "When the German and Scythian nations overran the Western provinces of the Roman empire, the confusions which followed so great a revolution lasted for several centuries. The rapine and violence which the barbarians exercised against the ancient inhabitants interrupted the commerce between the towns and the country. The towns were deserted, and the country left uncultivated; and the Western provinces of Europe, which had enjoyed a considerable degree of opulence under the Roman empire, sunk into the lowest state of poverty and barbarism. During the continuance of those confusions, the chiefs and principal leaders of those nations acquired or usurped to themselves the greater part of the lands of those countries. A great part of them was uncultivated; but no part of them, whether cultivated or uncultivated, was left without a proprietor. All of them were engrossed, and the greater part by a few great proprietors. This original engrossing of uncultivated lands, though a great, might have been but a transitory evil. They might soon have been divided again and broke into small parcels, either by succession or by alienation. The law of primogeniture hindered them from being divided by succession; the introduction of entails prevented their being broken into small parcels by alienation. But when land was considered as the means, not of subsistence merely, but of power and protection, it was thought better that it should descend undivided to one. In those disorderly times, every great landlord was a sort of petty prince. His tenants were his subjects. He was their judge; and in some respects their legislator in peace, and

their leader in war. He made war according to his own discretion—frequently against his neighbours, and sometimes against his sovereign." When, however, they became, by admixture of race, Anglo-Saxons and christianized, a great improvement gradually took place. They no longer sold their wives and daughters as slaves, and they appear to have been possessed of the most of the usual live stock and implements of ancient agriculture. Murrain and famine alternately diminished their live stock and population, much as it does now in ignorant and pagan nations; and one-fifth of their herds perished every winter from exposure and want of food. The wool of a sheep was valued at two-fifths of the price of the whole sheep.

A.D. 866.—In King Ethelred's time, the following prices were fixed by law:—A man or slave 20s., horse 30s., mare or colt 20s., ass or mule 12s., cow 5s., ox 6s., swine 1s. 3d., sheep 1s., goat 2d. The lands belonging to the Church were, generally, the best cultivated. The monks themselves engaged in the labours of the field as a means of support. Then, as now, the superior education, and consequent intelligence, of our clergy enabled them to improve agriculture.

1066 to 1400.—In the eleventh century William the Norman conquered England, and the foreign knights and others who accompanied him, or who afterwards settled here, made many improvements in horticulture and agriculture. They were, however, great game preservers, and their forest laws for its preservation were severe in the extreme. They delighted in the chase, planted the New Forest, and converted many extensive tracts of country into woodland as shelter for their game. Their ruined castles abound in Essex and Suffolk. Within three miles of Tiptree Hall is a fine specimen of their architecture, called Layer Marney tower—the adjoining church containing effigies of the Layer Marney family. As a rule they selected good land. The population was now estimated at about two millions. The drainage of the fens of Cambridge and Lincolnshire were commenced at this period, A.D. 1220. Our Scotch friends were considered behind us in farming. Essex was one vast forest, and stood foremost in Domesday Book for its number of pigs, which there found their food under oak and beech trees—the number was 92,991—Hertfordshire having only 30,705. A great many goats were kept as stock; and, even now, very old men tell me of the fierce she-goats which rushed out upon them, some eighty years' since, when Tiptree Heath was a wild and wooded waste. Lords of the manor had considerable privileges. They monopolised all the watermills; their tenants were compelled to send their corn to them to be ground. The lord of the manor monopolized also the privileges of baking his tenant's bread at the common "fourne." Windmills were not known in England until about 1150. The shoeing of horses with iron is not supposed to have been used before the Conquest. Horses were rarely used in agriculture. As there is much discussion just now about wearing beards, it may be interesting to know that our laity all wore beards until the Norman Conquest; so I suppose the Normans cropped as well as conquered us. They were, themselves, close shaved or croppen, for the spies reported to King Harold that they had whole regiments of priests, inferring from the practice of our then clergy that close cropping and priestcraft were

synonymous; our agriculturists will, therefore, be justified by precedent in discarding their razors. Landowners were not without their troubles; for in the reign of Edward II. (1307), the estate of the elder Spenser, in Suffolk, was ravaged by his enemies, who carried off 28,000 sheep, 1,000 oxen and heifers, 1,200 cows with their calves for two years, 500 cart-horses, and 3,000 hogs. In 1317 harvest was all gathered by the 1st of September, and wheat fell to one-twelfth of the price at which it had been sold a few weeks previously. The fluctuations in the prices of corn seem to have been much greater formerly than of late years. In 1202 and 1223 it was 12s. per quarter, 1237 3s. 4d., 1243 and 1244 2s., 1246 16s., 1257 24s., 1258 20s. 1270 96s. and also £6 8s., 1286 2s. 8d. and also 16s. Considering the high value of money at those periods, it is easy to imagine what suffering, starvation, and disease must have followed the years of scarcity. Such enormous fluctuations could only arise from a concurrence of other evils with an unpropitious season, such as invasion, civil war, and rebellion, from which, thank God, we are now exempt; and we ought highly to prize the blessings of good government and good laws, well administered, which we now enjoy. Much of our progress is founded on a conviction that life, and property, and liberty, are secure in this happy country. Farmers are no longer called villains and churls, subject at any moment to do military or other service, at the command of their lords; nor have they to guard their flocks and property against the thousands of robbers and murderers who formerly infested this country. The proportion of pasture land to arable gradually decreased, but was still as twenty to one. The steward of the manor (Hawsted, in Suffolk) kept the manorial and farm stock accounts in *Latin*. This would now puzzle some of our modern stewards.

A.D. 1400 to 1480.—During this period our flock-masters must have improved the quality of their wool, "the cheap and principal commodity of the realm," for it was highly esteemed abroad, and the demand exceeded the supply. I presume the mutton was also improved, and that the animals were better fed, for in former times sheep were kept for their wool only. "Villains" were gradually emancipated, and became free labourers, and a new class of cultivators arose, paying money rents. At the Hawstead Manor Farm, Suffolk (Sir T. Cullum's) the produce of sixty-one acres of wheat for three years was two hundred and ten quarters, about nine bushels per acre, and, as the price was low, this was no doubt a good crop, and certainly the farming would be quite equal to or above the average. The quantity of seed sown was two-and-a-half bushels, so that the return was hardly four to one. The produce of the different grains at that period, on that farm, was—wheat 8 bushels, barley 12, peas 12, and oats 6—a very small return for the quantity of seed sown, and something like what is now grown in many foreign countries that supply our market. In the fifteenth century much arable land was laid down to pasture, on account of the high price of wool, and also because of the scarcity of labour. The villains having been made free labourers betook themselves to handicrafts and manufactures. Land appears to have been let still at cheap rates, say 4d. to 8d. an acre, and it must have been of a fair average quality, as it was on Sir Thomas Cullum's estate, in Suffolk; in fact, in 1490, the Abbot of Bury, Suffolk, let eighteen acres of

pasture, on a lease of eighty years, for 4½d. per acre. Landlords reserved to themselves the right of immediate re-entry if the rents were not punctually paid. As to wages at that time, a bailiff received 25s. a year, besides meat and drink, and 5s. a year for clothing. A chief hind, carter, or shepherd, 20s., and for clothing, 4s.; a woman-servant, 10s., with 4s. for clothing; a common labourer, 15s., and 3s. 4d. for clothing; and he seems to have been left to provide his own diet. In harvest, wages were higher, say 4d. with meat and drink, or 6d. if he provided for himself; a reaper or carter, 3d. with, and 5d. without, provisions; a woman, 2½d. with, or 4½d. without. These wages were fixed by statute, but still labourers became scarce. Cotteswold wool was in great demand by the Flemings, Venetians, and others, for the manufacture of fine cloths; and it is said that Cotteswold sheep, being sent to Spain, produced—as a result, I presume, by a cross—the celebrated Merino. We had not at that time learned the art of working up our fine wool at home; we were at this period exporters of grain to foreign parts, and a law was passed to compel boroughs, towns, &c., to provide a standard bushel measure. The use of coal became now more general. How oddly this sounds to us, who know that last year the consumption of the twenty-one mile circle around London was 5,000,000 tons, of which 1,500,000 tons came by rail.

1408 to 1608.—During this period a large advance was made on our agricultural condition. Farmers passed from wooden trenchers and wooden spoons to pewter, and even in some cases to silver. Their straw pallet was exchanged for a feather-bed; and their rents were doubled. The softer sex also found their condition ameliorated. All this took place concurrently with, and as a corollary to, our progress in manufactures and commerce.

Comfort for the British Landowner.—Adam Smith says, in his "Wealth of Nations:" "Every improvement in the circumstances of society tends, either directly or indirectly, to raise the real rent of land; to increase the real wealth of the landlord—his power of purchasing the labour, or the produce of the labour, of other people. The extension of improvement and cultivation tends to raise it directly. The landlord's share of the produce necessarily increases with the increase of the produce. That rise in the real price of those parts of the rude produce of land which is first the effect of the extended improvement and cultivation, and afterwards the cause of their being still further extended (the rise in the price of cattle, for example), tends, too, to raise the rent of land directly, and in a still greater proportion. The real value of the landlord's share—his real command of the labour of other people—not only rises with the real value of the produce, but the proportion of his share to the whole produce rises with it. All those improvements in the productive powers of labour which tend directly to reduce the rent-price of manufactures, tend indirectly to raise the real rent of land. Every increase in the real wealth of society, every increase in the quantity of useful labour employed within it, tends indirectly to raise the real rent of land. The contrary circumstances—the neglect of cultivation and improvement, the fall in the real price of any part of the rude produce of land, the rise in the real price of manufactures, from the decay of manufacturing art and industry, the declension of the real wealth of society—all tend, on the other hand, to lower the real rent of land,

to reduce the real wealth of the landlord, to diminish his power of purchasing either the labour or the produce of the labour of other people."

1600 to 1660.—Matters moved slowly during this period. In agriculture, gardening, and manufactures, England was surpassed by several other countries, particularly by Holland and the Netherlands. These were the most industrious countries in Europe; and their population had been longer trained in those habits of order which are essential to industrial pre-eminence, and in which ours was deficient. Our Dutch and Flemish neighbours improved us in fen drainage, and in reclaiming land from the sea: they also introduced new seeds, and improved our agricultural practice. Implements and usages still varied in every county, and almost in every parish. Bligh, in his "Improver Improved" (1652), pointed out the advantage of growing clover for cattle; and Sir Richard Weston soon after published an account of the cultivation of turnips in Flanders, by which cattle and sheep might be fattened in winter. The woollen was still the most important branch of non-agricultural industry. Hackney-coaches made their first appearance in 1625, there being only twenty for the metropolis and its neighbourhood.

1660 to 1760.—Our manufactures continued to improve by instruction from other countries; and the exportation of wool was now prohibited. Spitalfields, in London, now produced silk manufactures; and Frenchmen, at Ipswich, made fine linen, which sold at 15s. per ell—an enormous price, looking at the then great value of money. Agriculture also advanced. The historian says: "The state of things to which the Revolution of 1688 put a termination, was favourable to the development of agricultural industry during the present period. Other political circumstances also favoured the landed interest; and for eighty years after the Revolution, England, as we have seen, was a corn-exporting country. From 1697 to 1773, the total excess of exports amounted to 30,968,366 qrs. of corn, upon which bounties were paid of not less than £6,237,176. From 1748 to 1752, the average quantity exported was 643,961 qrs. annually. The bounty paid in 1750 amounted to £324,176. Fresh land was brought into cultivation, and in 1710 the first Enclosure Act was passed. In 1697 a duty was laid in England on malt; and the same duty was extended to Scotland in 1713. In 1710 the winnowing machine was introduced from Holland: in Scotland, its use was denounced from the pulpit as impious. The thrashing machine was first employed in the northern parts of the island about the same time. No instrument for saving labour has made such slow progress; and in many extensive districts its use is unknown even in the present day. In 1732 Jethro Tull commenced his experiments in drilling and horse-hoeing on his farm in Berkshire; but thirty years elapsed before they excited much practical attention, and before the really valuable parts of his system began to be adopted by intelligent agriculturists. Towards the close of the period, the extension of the turnip husbandry was already effecting the most important revolution in the history of modern agriculture. Those improvements were also commenced which have gone far towards eradicating the defects of the ancient breeds of domestic animals in this country. Bakewell, the great improver of live-stock, began his experiments about

the year 1760. The writings of Evelyn, published near the close of the last period, had awakened a taste for horticulture and planting. Gardens had become a luxury, on which large sums were expended. The cottage of the labourer began to be considered incomplete without a plot of ground for the cultivation of vegetables; and a great increase took place in the quantity and variety of vegetables consumed by the labouring classes. The farmer who did not provide plenty of greens, peas, and beans; for his servants to eat with their salt meat, was despised for his parsimony. By the middle of the century, the cultivation of the potato had become almost general in every part of England, and the prejudice against its use had been nearly removed; but in some quarters premiums were still resorted to, for the purpose of bringing this root into consumption amongst the poor."

1760 to 1860.—This being decidedly the most progressive era in the history of British agriculture, I have annexed a chronological list of the many important agricultural events of that period—which progress was still mainly owing to our great manufacturing advance, and consequent rapid increase of population. Judging of the future by the past, what are we to expect in agricultural progress from 1860 to 1960, with a population of 50 or 60 millions, instead of 30 millions? Our population was, a century ago, probably not more than six or seven millions; now it is 30 millions. The mind naturally asks, How long is this manufacturing increase to go on, and when shall our manufactures have attained their climax, and when shall commence their decline? Because then shall, indeed, begin the decay of British agriculture. Begging pardon for this digression, I must again quote from the historian of that period: "In 1784 roads had improved, and Mr. Palmer started the first mail coach; previous to this 380 towns got their letters only three times a-week, and 40 towns had no post at all, but now they get them daily: From 1785 to 1800 there were 683 Acts of Parliament relating to roads, bridges, &c.; 196 to canals; 834 to enclosures, draining, &c."

Legislation affecting Agriculture.—Our senators appear to have been constantly attempting to set agriculture in order, according to their own notions, by Acts of Parliament. They do not appear to have succeeded very well in their objects, for most of the Acts fell into desuetude, or were evaded; some of them would sound oddly at the present day, such as: No tenant should rent two farms. No tenant-farmer should have more than 2,000 sheep. 1538, That the King was to have half the profit from all land converted from tillage into pasture until a suitable house was built upon it. Every cottage was to have four acres of land; and no more than one family in each cottage; There was an Act to restrain the excessive use of malt, and justices were empowered in quarter sessions to suppress the making of malt, and the number of maltsters. Farm-houses that had decayed were to be rebuilt compulsorily, and 20 to 40 acres attached to them. Roast beef at Christmas appears to have been a luxury of modern times—thanks to turnips, mangel, cake, clover, and other winter food; for, formerly, as soon as the depasturing season ended, the fat animals were killed and salted, to prevent their becoming lean again—the hay being required for cows and young growing animals. Bullocks and sheep, too, were then a long while growing to perfection for the

butcher, much as it is now in many foreign countries, whose agriculturists—when they visit England—express surprise that our live stock should be so large and so fat at so early an age.

Roads, Canals, and Railroads.—One hundred years ago we were without either, and in winter the country was impassable. Arthur Young, in his tours, execrated the ruts four feet deep on what were called roads in his time. I wish time would permit me to transcribe his graphic description of the difficulties of locomotion and intercommunication. After carriages were invented the nobility and gentry had their "footmen," who ran by the sides of the carriage, and with their long sticks, which are now used for ornament, propped up the carriage when in danger of turning over.

The Government Drainage Loans.—If evidence were wanting of the necessity for aggregating capital, in the hands of great companies, for the purpose of agricultural improvement, we should find it in the eagerness with which the first Government loan of two millions sterling was taken up and made use of. Our keen Scotch friends were so alive to its advantages that they took the whole, and our less 'cute Southerners were too late in their application. So in the second loan of a million, a portion was reserved for the tardy Englishmen. A noble duke, a great and acute improver, who had an immense estate in Scotland, told me that he had a large slice of the first loan, and would have taken much more had he been permitted to do so.

The Establishment of the General Board of Health has had a most beneficial influence on the sanitary condition of the nation, but, oddly and inconsistently enough, the tendency of its operation is to deprive the British people of their food; for the only means by which the national food can be permanently produced is by means of those very excrements which the Board of Health Act does not direct to be applied to the soil, but which are wasted in polluting our rivers. The calamitous national effects which must ultimately result from this suicidal system have been already fully commented upon, in the paper I had the honour to read before you, "On the Sewage of Towns as it affects British Agriculture"; I will, therefore, only say that, if the Legislature does not interfere to compel a different appropriation of the sewage, I trust that the landholders and farmers of this kingdom will exert themselves to prevent so fatal and so palpable a waste of their substance.

The New Poor-Law of 1834 saved this country from desolation and agriculture from destruction; it taught the landholder and his tenant that property had its duties as well as its rights, and that agriculture was never in greater error than when it hoped to save itself by the non-employment of human labour. It also proved that to pauperize the labourer by paying his wages as alms, was to destroy his self-dependence and demoralize his character.

The Tithe Commutation Act of 1836 opened the flood-gates for investment and improvement, where they would not otherwise have entered. It has, also, removed an element of embitterment between the clergy and their flocks, and has greatly promoted the cause of religion and kind feeling. It caused the conversion of many woods and waste into food-producing soil. Tithes were first imposed upon the Mercians in the latter part of the eighth century, by their king, Offa, and the tax was extended over all England

by King Ethelwulf in 855. Owing to the great extent of forest and waste, the total must have been small. Tithes were applied to the repair of churches, the expenses of worship, and the relief of the poor, as well as to the maintenance of the clergy. Pious individuals, however, contributed lavishly with lands, &c., and so enriched the church. This is now prevented by the Law of Mortmain.

Richard Cobden and Sir Robert Peel.—I do not venture to give an opinion on the much-vexed political questions involved by their names, for that is very properly forbidden by the rules of our Club; but, practically, free-trade has done for British agriculture an enormous good. It has awakened the slumbering and heretofore unsuspected powers of the British agricultural lion. We all must well remember that the anticipation of a ruinous and impossible competition sorrowed the minds and angered the feelings of those who thought they saw in free-trade the loss of their capital and ruin of their families. But fear and despair gave way to reflection, and to the comprehension of his exact comparative position. The British farmer, like the British manufacturer, faced the difficulty, and has sustained the competitive race by rapid improvement. That great race, although sustained, will be more than won by unheard of and future progress, and half a century hence our agricultural grandchildren will look back upon the condition of their progenitors much as we do on ours of the past age.

The Act for the Enfranchisement of Copyholds will gradually sweep away the old feudal responsibilities, and give security to improvers. A copyhold farm of my own is subject to a live heriot at my death, and no doubt when that occurs, the steward to the lord of the manor will claim my best horse or bullock, as well as 1½ years' rent.

Implemental Improvers.—We owe to Tull the drill and horse-hoe, to Bell the reaper, and to Meikle the thrashing machine. The two last were Scotchmen. It is hardly possible to over-rate the important benefits these implements will confer on British agriculture. The time and money they save largely aid us in a successful competition with foreigners. It is a singular but significant fact that although Mr. Bell had used the reaper (invented by his brother, the Rev. Patrick Bell, still living at Carmylie, near Arbroath, who in 1828 received a £50 prize for it from the Highland Agricultural Society) for thirty years, no one seemed to know anything about it; and when his machines, Americanized, appeared in the Great Exhibition of 1851, they were regarded as curiosities and novelties. The public trial of them, on my farm, in the presence of a distinguished company, at once launched them into practical use. I have used one of them ever since.

Agricultural Implements and Machinery.—If I wished to convince agriculturists of the importance of steam, I would, in their presence, ask the implement makers how much they would enhance their prices if compelled to go back to manual labour or horse-power as a motive force? The answer would probably be, "It is not a question of price, for we could not produce enough even at an advance of 50 to 100 per cent." As I wander through the implemental labyrinth at our great shows, I ponder in my mind whether farmers entertained this question, and applied it to their own case. We no longer see the farmer or his men making their own wooden plough and other tools at home

as in ancient times; but the steam-blast, the steam-hammer, the steam circular-saw, and the steam-turned lathe, have transformed our blacksmiths' shops into gigantic and money-making factories, whence agriculture derives the cheap and effective means of a successful competition with less advanced corn-growing countries. It would be ungracious to omit honourable mention of the Ransomes, Garretts, Hornsbys, Claytons, Howards, Barretts, and others, who have so admirably met the mechanical demands of modern agriculture. It is my lot to welcome many foreign agriculturists, and as I catechize them, I often wish that I had by my side the agricultural alarmist. He would hear them say, "We have no roads, or we cannot use them in bad weather; we have the old wooden-plough; we never hoe our corn, our men do not understand this machinery; we do not drill our corn; we keep our sheep three or four years before they are fat; we use no oilcake—our animals live on straw in the winter; we are very far from a market or river—we have no railways or canals; we grow three, four, or five bushels for one." A brother of a neighbour of mine emigrated to America, and, writing to his brother, said, "I expect to see something of the country, for so-and-so is going out with a load of corn to market (Chicago); he will be gone three weeks, as it is 50 miles away." This I know to be a fact. It is a variety of these difficulties which beset the foreign cheap producer; and it is the reverse of all this that comforts and profits the British farmer.

The Establishment of Farmers' Clubs and Agricultural Societies has had a most beneficial influence on agricultural progress, which has been stimulated and improved by competitive exhibitions, by the reading of papers on agricultural subjects, by the discussions following thereon, and, above all, by the diffusion of those readings and discussions by means of the agricultural press. It is a painful, unaccountable, and not very creditable fact, that the only society in Britain that forbids the free and public reporting of its discussions and proceedings is the Royal Agricultural Society of England! In other respects it has conferred great benefits on British Agriculture, especially by its itinerating annual exhibitions for live stock and machinery. Its "Journal" has also done good service. The same good results have followed from the Highland Society and its "Journal," and the Irish Agricultural Society, and its "Journal," and their exhibitions. It would be doing an injustice to Scotch agriculturists not to compliment them on the talent displayed at their discussions, resulting, no doubt, from those more abundant educational facilities which have existed in Scotland, compulsorily, more than in England. Probably this was the cause of their "Agricultural Journal" appearing so many years before that of the English Society.

The Smithfield Club, by its early and original Exhibition of Live Stock, deserves especial commendation as the pioneer in animal competitive exhibitions, which have dispelled self-sufficiency and developed animal perfection. Among the greatest benefactors to agriculture stands

Baron Liebig.—If an accurate account could be taken of the quantity and value of the additional food produced through his discoveries, the world would be grateful, and we should look upon him as a great benefactor to mankind. By the light of his great mind, the darkness of

agriculture, with regard to the nutrition of plants and of animals, is being rapidly dispelled. Like a great magician, he has taught us to convert bones and mineral apatite into milk, cheese, mutton, and beef. He has taught us that the earth on which we tread forms an indispensable portion of animal and vegetable structure. He discovered floating in the passing breeze the fat and muscle of our bodies. The once exhausted pastures of Cheshire owe to him their fruitful regeneration, and every Cheshire cheese should in gratitude bear his impress. As an eminent chemist remarked to me the other day: "he has knocked down all the old skittles"—meaning the old erroneous agricultural theories. He has supplanted them by imperishable truths. He has pointed out to us, in perspective, why a "peppering" of guano rivalled the massive dung-heap. He has entreated us to believe that the waste of our excreta through our sewers is equal to an enormous exportation of corn and meat without receiving its value in return. I am a firm believer in his mineral theory. Agriculture will, at some future age, raise a monument to his memory as the Sir Isaac Newton of agricultural discovery.

What Modern Agricultural Progress owes to Manufactures.—Let us ask how it is that within the last seventy years agriculture has made such enormous strides as compared with its former history? The answer is ready and simple. We have become the workshop of the world; nearly nine-tenths of our population are engaged in, or dependent upon, manufactures, commerce, trade, and other occupations, non-agricultural; whilst this once purely agricultural people represent now only one-tenth of the national population. Agriculture owes nearly its all to the spinning-jenny, the power-loom, the mule, and the thousands of new inventions and new occupations of modern times. Mighty steam pours into the national lap the estimated labours of a supposed population equal to that of the whole world. The well-to-do and multiplied millions—under ground, above ground, on the broad waters, and on the busy rail—make greedy and unsatisfied demands on the British farmer, who, shame to say, helpless and powerless, is unable, because unwilling, to respond to the call. Like a negligent shopkeeper, he compels his best customers to deal with and strengthen his competitors' hands over the water. Is there one agriculturist who can still harbour in his mind a lurking belief that his own interest is opposed to that of trade, commerce, and manufactures? If so, let him sweep away, in his imagination, the towns, and cities, and factories, the iron and coal mines, the railways, and mercantile fleets; and let him fancy himself, like the ancient Briton, a producer with no other customer than himself, his lord, his warriors, and his governors.

There was a time when Agriculture cast a jealous and disapproving eye on Manufactures, but I trust intelligence has removed it. It is precisely because British farmers have their customers—the British manufacturers—almost at their doors, and that other corn-producing countries have not any manufacturers, that British agriculture is more rich and thriving. The larger the population employed in manufacturing for foreigners, the better for the English farmer and the English landlord; for no doubt the latter will always participate largely in the farmers' well-doing. Farmers and country gentlemen sometimes look with an unkindly eye on apron-string farmers or cotton lords; but

this should not be. Hear what Adam Smith says in his "Wealth of Nations" (page 167):—

How the Commerce of Towns Contributed to the Improvement of the Country.—"The increase and riches of commercial and manufacturing towns contributed to the improvement and cultivation of countries to which they belonged, in three different ways. First, by affording a great and ready market for the rude produce of the country, they gave encouragement to its cultivation and further improvement. This benefit was not even confined to the countries in which they were situated, but extended more or less to all those with which they had any dealings. To all of them they afforded a market for some part either of their rude or manufactured produce, and, consequently, gave some encouragement to the industry and improvement of all. Their own country, however, on account of its neighbourhood, necessarily derived the greatest benefit from it: its rude produce being charged with less carriage, the traders could pay the growers a better price for it, and yet afford it as cheap to the consumers as that of more distant countries. Secondly, the wealth acquired by the inhabitants of cities was frequently employed in purchasing such lands as were to be sold, of which a great part would frequently be uncultivated. Merchants are commonly ambitious of becoming country gentlemen, and when they do, they are generally the best of all improvers. A merchant is accustomed to employ his money chiefly in profitable projects; whereas, a mere country gentleman is accustomed to employ it chiefly in expense. The one often sees his money go from him, and return to him again with a profit; the other, when once he parts with it, very seldom expects to see any more of it. Those different habits naturally affect their temper and disposition in every sort of business. The merchant is commonly a bold, a country gentleman a timid undertaker. The one is not afraid to lay out at once a large capital upon the improvement of his land, when he has a probable prospect of raising the value of it in proportion to the expense; the other, if he has any capital, which is not always the case, seldom ventures to employ it in this manner. If he improves at all, it is commonly not with a capital, but with what he can save out of his annual revenue. Whoever has had the fortune to live in a mercantile town, situated in an unimproved country, must have frequently observed how much more spirited the operations of merchants were in this way, than those of mere country gentlemen. The habits, besides, of order, economy, and attention, to which mercantile business naturally forms a merchant, render him much fitter to execute, with profit and success, any project of improvement. Thirdly, and lastly, commerce and manufactures gradually introduced order and good government, and with them the liberty and security of individuals, among the inhabitants of the country, who had before lived almost in a continual state of war with their neighbours, and of servile dependency upon their superiors. This, though it has been the least observed, is by far the most important of all their effects. Mr. Hume is the only writer who, so far as I know, has hitherto taken notice of it."

The Effect of a New and Extensive Gold Finding affects the "price" of agricultural produce, if not its "value," as shown by the following extract from Doubleday's "Financial History of England," and, no doubt, is doing so now:—"The grand alteration in the value of the precious metals, and, of course, of money along with them, to which I would

refer the reader, is that which took place in about thirty years after the discovery of America, by Columbus, in A.D. 1492. The reign of Henry VIII. commenced in A.D. 1509. Before he had reigned twenty years, the conquest of Mexico and Peru had been completed by the Spaniards; and the Portuguese were busy in the Brazils, which they ultimately overran and subdued. From that time—that is to say, from the early part of the reign of Henry VIII.—gold and silver continued to be poured into Europe, in unprecedented plenty throughout the period comprised in the sixteenth and seventeenth centuries, causing a continually growing circulation of money, and a rise of prices in all commodities over all Europe, for which men were puzzled how to account, and which began to be sensibly felt in England about the middle of Henry's reign. This was the first time that men had witnessed the phenomena of a huge accession, all within a few years, in the precious metals then circulating; and to those living at the time the whole was a puzzle and a mystery. The enhanced prices were in England wholly attributed to monopoly, to hoarding, to forestalling, to large farms—to any cause but the true cause, which true cause was *the lowering of the value of gold and silver*, by the discovery of the rich mines of Mexico, Peru, and ultimately of the Brazils. To prove, then, the real effect of this vast and rapid addition to the circulating medium, we have only to take a bird's-eye view of the prices before and after the event. Let us begin with wheat. The following is extracted from Adam Smith's "Wealth of Nations":—"Prices of wheat before and after the opening of the American mines: Average, A.D. 1423 to 1451, 10s. 7d. per quarter; 1453 to 1497, 8s. 5d.; 1459 to 1560, 9s. 2d.; 1561 to 1601, 47s. 5d.; 1595 to 1636, 50s.; 1637 to 1700, 51s. 3d." Here we see that during the period between 1560 and 1601, a space of forty years, the average price of wheat has grown five-fold. Not that grain was scarce during those forty years, but because, throughout the whole of them, the precious metals kept pouring into Europe from Peru and Mexico, with a rapidity almost inconceivable. To show that the same effects were produced upon the prices of all sorts of merchandize and commodities, I subjoin a curious document, extracted from Drake's "Eboracum":—

Table of Prices.

Prices proclaimed at York, 1693.			Prices at York in 1733.		
	£	s. d.		£	s. d.
Strong Beer, per gal.	0	1 1/4	Strong Beer, per gal.	0	2 0
A milder sort	0	0 1	Mild Ale	0	1 0
Finest Claret Wine	0	0 8	Best Claret	0	17 0
All Common White			White Port	0	8 0
Wines, per gal.	0	0 6	Red Port	0	6 8
Carcass of finest Beef	1	0 8	Choice carcass of Beef	9	10 0
Next Best	0	14 0	Next Best	8	0 0
Scotch Kyle Ox car.	12	0 0	Scotch Kyle	0	4 4
Ditto Cow	10	0 0	Cow, ditto	3	0 0
Carcass of Mutton, best	0	1 8	Carcass of Mutton, best	1	10 0
Ditto, worse fed	0	1 6	Ditto, worse fed	1	0 0
Carcass of fine Veal	0	2 6	Carcass of fine Veal	1	6 0
Another sort, ditto	0	1 6	Another sort, ditto	0	15 0
A Lamb	0	0 8	A Lamb	0	12 0
A fat Pork Hog	0	3 4	A fat Pork Hog	2	10 0
A smaller Pig	0	3 0	A smaller Pig	2	0 0
A Capon	0	0 4	A Capon	0	1 9
A Hen	0	0 1 1/4	A Hen	0	0 9
A fat Goose	0	0 4	A fat Goose	0	2 0
A Doz. of Pigeons	0	0 3	A Dozen Pigeons	0	1 3
A Woodcock	0	0 1 1/4	A Woodcock	0	0 9
A Teal	0	0 1 1/4	A Teal	0	0 9

The present and past Condition of Agriculture in its relation to Manufactures.—Agriculture enjoys great privileges and advantages now, in comparison with former times. The skill, capital, and enterprise of our manufacturers, aided by

that great invention steam, has raised up an enormous population of customers non-agricultural, placed at the disposal of agriculture cheap and abundant clothing, as well as more perfect and less costly implements of agriculture. In 1487 three quarters of corn were given for one yard of fine broad cloth; now the quantity obtainable would be near eight yards; nobody wore knitted stockings until Queen Elizabeth's reign. She is said to have been the first person in England to wear them. She received them as a present from the Spanish Ambassador. We all know that our ploughshares and other agricultural implements harmonize in reduction of price with our cheap cotton and woollen manufactures. The village church on the Sabbath presents the pleasing pattern card of elegance and cheapness. The wife and children of the agricultural labourer, whose weekly wages represent the value of one bushel of flour, are clad in colours, patterns, and qualities that convince the observer how much agriculture owes to the science and skill of manufactures. The recent discovery of the sewing machine has multiplied by millions the powers of the seamstresses. But how has all this been brought about? Not by an obstinate adherence to old customs, but by a recognition of the value of science and by an availment of its powers. In this respect agriculture has much to learn from manufactures, and must make haste to follow its example.

The Future of Agriculture must be based on a General Use of Steam Power.—This has made manufacture what it is, and will make agriculture what it ought to be. At present we can scarcely say that agriculture has used steam—possibly she may now have 50,000-horse power: she will soon have at least a million of horse power. I speak practically and guardedly on this matter. Every farmery of 100 acres will, for the purpose of cultivation and general manipulation, require four-horse power. If 100 acres require four-horse power, sixty millions of acres will require 2,400,000 horse power.

The Topography of our Farms inflicts a Gigantic Charge on Farm Produce.—It is singular that, whilst 1,400 years ago the civilized Romans left with us indestructible examples of facile intercommunication by broad and well-made roads, straight as the flight of an arrow, we content ourselves with perfect contortions in our roads and lanes. To sit down and calculate in detail the loss occasioned by these deviations from rectitude, would produce an alarming and astounding aggregate. But how is this now to be remedied? No one will attempt the task with our present cumbrous, costly, and ridiculous mode of transfer; and so one item, or rather one means, of a successful competition with foreign production is debared from us. The financial history of the cost of a quarter of wheat, in all its details, would afford an instructive and profitable lesson, and would exhibit a biting satire and a severe rebuke. It would humble our agricultural pride, and would show that we cannot, as agriculturists, stand the test of commercial criticism. When I say this, let it be understood that I especially refer to the duties and shortcomings of landowners, who, being principally our law-givers, have the power (if they choose to exercise it) of amending the Laws of Conveyancing. Assuming that the frequent removal of heavy steam-engines and machinery from one part of the farm to another, or from one farm to another, will render necessary temporary railroads, or very improved public and farm roads, it becomes of the utmost importance, on the score of economy, that our

agricultural topography should be amended. A farm of 640 acres would fill one square mile—the buildings being central and the roads straight, every portion would be readily accessible; but if a survey were to be given to us of the existing topography of every farm of that size, it would reveal a barbarous waste of means intolerable in this age of practical economy.

The importance of Improved Means of Locomotion for our Farm Steam Engines is well illustrated by the following fact:—On a recent visit to a spirited improver, on a heavy-land farm, I saw Fowler's steam-plough working a circular-saw instead of drawing the ploughs. "You see," said my friend, "here is my £700 worth of power unavailable for cultivation. It weighs seven tons, and although our land is drained it is impossible to get it about our stiff clays. I purpose laying down a light rail for it, through the centre of this 250-acre piece, so that its power may be at any time exerted, either on the land or in the farm-yard." And this reminds me how unreasonable it is of the Royal Agricultural Society of England to try all their implements in the hot, dry month of July, when the winter difficulties of a stiff-clay farm are thus practically ignored. Let us hope that the prize-sheet of this Society will offer prizes for the best and cheapest railway means of rendering steam-power available at all seasons, except during severe frost. I am gradually coming to the conclusion that such means will be a necessary concomitant of steam culture, as it has been to our locomotion. It must not be forgotten that one meritorious feature of Mr. Smith's (of Woolston) system of steam culture is, that there is very little necessity for removing the heavy engine—a great advantage in wet seasons on a heavy-land farm. While on this subject permit me to quote a letter from Mr. Pike, which illustrates most forcibly, clearly, practically, and truthfully the enormous advantages resulting from *The Use of Steam in Cultivation*, and of the necessity for fixity of engine in wet weather on stiff clays. "Stevington, near Bedford, Dec. 31, 1860. GENTLEMEN,—I very willingly send you my views and opinions upon the Steam Cultivator. Before I came into Bedfordshire I farmed in Buckinghamshire, when I knew the land of Mr. Smith, of Woolston, and having witnessed the great improvements he subsequently made by his system of steam cultivation, I was induced to order a set of the apparatus from you, in the spring of 1858. I have now worked my apparatus for three seasons, and having done upwards of 2,000 acres of land with it, I am in a position to speak with some confidence as to its success. The effect on the crop has been very visible each season, but I think the greatest advantage was manifest last harvest. My wheat crop was particularly good, which, after so much wet, I had no right to expect on such heavy land; but I find, after steam cultivating, the water gets down to the drains so much quicker, indeed I have now dispensed with the furrows altogether; one field, which is rather steep, containing fifty acres, all lies on the flat, and I never saw any water stand upon it, although the land is very stiff. My farm, belonging to the Duke of Bedford, contains about 370 acres of arable and 130 acres of grass land, I formerly worked fifteen or sixteen horses, but since I have got my steam cultivator I have managed with seven or eight, and have always been much more forward with my work than when dependent upon my horses; indeed I should be very sorry to farm this strong hilly land without steam power. I am also enabled to grow a much larger acreage of root

crops with a heavier yield. The present season proving so excessively wet has prevented me doing as much work as I should have done, still I am very much forwarder with my work than I could have been with fifteen horses to keep, whether able to work or not. I have seventy-five acres of wheat looking remarkably well, some of which would certainly not have been sown had I not had the steam cultivator. I have also put in my tares with the steam cultivator; on account of the wet, I sowed them on the stubble before breaking it up: they promise better than those around me, put in in the ordinary way. I therefore entirely disagree with people who entertain the notion that a steam cultivator is of little use in such wet seasons. I have found it exactly the reverse. I have also broken up and crossed my wheat stubbles, intended for roots and mangolds, and, notwithstanding the wet, I have made a good job of them. I usually bout this land in 27-inch ridges, as I think it lies drier and sweeter for the winter; but the backwardness of this season has prevented me. My clover leys I broke up just before harvest, and as usual made a *bastard* fallow of them. From long experience on clay land, I am convinced that this system is a surer mode of securing a good wheat crop than leaving your clover ley down until Michaelmas; it also has this advantage, the work of the farm does not fall in so much at one particular time. My tare land was broken up before I commenced the clover leys. Upon my bean stubbles, in an ordinary season, I use my steam cultivator only once, merely harrowing once before and once after the drill. Last year I cultivated sixty acres of bean stubble in this way, upon which I had most excellent crops of wheat. I kept an accurate account of the cost of preparing this land by steam, and found that for labour, fuel, &c., it was exactly 4s. 7d. per acre. I have no interest whatever in extending the use of the steam cultivator, but feeling obliged to Mr. Smith and yourself for enabling me to cultivate my own land cheaper and better, I have thrown open my farm to all comers, and, in addition to many from distant counties, it has afforded me pleasure to find some of my neighbours, good practical farmers, following my example; for when I commenced, very few thought I was acting wisely in making so great an outlay in what they termed 'an experiment.' In Mr. Dring's letter, I notice he says that he finds setting down to a large piece is a mistake: I think it is a mistake to set down to small pieces. I have one field of 36 acres, which I break up without going into the field at all. I put the engine and windlass in an adjoining field, and finish headlands and all, without shifting either engine or windlass. I have another field of 50 acres, in which I have dug a pond at one end, and I set the engine and windlass against the pond, and cultivate the whole without shifting or requiring a horse to fetch water. I sometimes dam up drain or ditch, and obtain water in that way, for in a wet season water carting is a great nuisance. I have increased the length of my ropes to enable me to do these large fields, I expected it would take more power, but I don't find it makes much difference to my engine, which is one of Clayton and Shuttleworth's 8-horse double cylinder. I was always told, 'Don't get too much rope out, you will want so much more power.' I am no engineer, and cannot go into the reasons, but I find from experience that the length of rope makes very little difference to my engine. As before stated, I have now done with the steam cultivator upwards of 2,000 acres of land, and my rope, although the worse for wear, is still in working order: the other portion of the apparatus is very little the worse for wear. I am convinced that, if people will attend to the coiling of the rope, and exercise moderate care, the rope will last for years. I am sure the expense of keeping the whole in repair is not nearly so much as the repairs of a steam thrashing-machine. I prefer the engine and windlass separate, as they are more easily moved from field to field, and along bad roads, than the combined engine and windlass I had on trial. I don't think much will be done in letting out steam cultivators, as the expense and trouble of haulage is so much greater than with thrashing machines. I speak from experience, as I have let out both, but have given over letting out my steam cultivator; indeed, I have 90 days' work a year for it on my own farm.—I am, gentlemen, yours truly, WILLIAM PREE.—Messrs. J. and F. Howard, Bedford.

The Test of our still Backward Condition in Agriculture,

and the Necessity for its Improvement.—According to our best calculators, the average gross available agricultural produce of Britain is barely £3 15s., or less than four rents, per acre. Our arable and pastoral available acres may be set down at 60 millions. Our population is 30 millions. We don't produce enough to feed them and their animals, and therefore they not only consume the produce of two acres per head, but are obliged to consume, at least, another acre per head of foreign produce. Let us test this calculation by an unerring proof. 350 convicts in our City of London Prison at Holloway consume weekly 2s. 3d. worth of food, or by the year £5 17s.; clothing, per week, 4d., 17s. 4d.; paupers in our East London Union consume weekly 3s. 8d. worth of food, or by the year £9 11s. 9d.; clothing, per week, 3d. 4d. So putting the pauper and the convict together, each would consume £7 14s. 4d., or more than the produce of two acres. How many acres would an Alderman of the City of London require? It really is a humiliating fact that we are unable, or rather unwilling, to feed our own people; for my own return per acre, on my own poor farm, is more than three times the average of the kingdom. Therefore, I know we could feed our people if we chose to invest enough capital and intelligence, both as landlords and tenants.

Spirited Instances of large, but successful Investments.—A friend of mine in Norfolk, who had farmed 1,200 acres of poor light land for some 25 years, told me the other day that he had expended £70,000 in oil-cake, and £50,000 in artificial manure during his occupation. This would be £100 per acre over the whole farm—pretty well as a tenant's investment; and we can hardly be surprised that his once poor rabbit warren land has now become highly fertile, profitable to the tenant, and producing a largely-increased rental to the landlord. But has the landlord done nothing in this matter? Oh yes! He has given hope and security to his tenant by a long and by a renewed lease. He has retained a good farmer on his estate, and sees in the rising generation of that farm young men brought up to a high and intelligent culture as a system. A foreigner was, the other day, much astonished to see a farm-house, erected by the landlord, at a cost of £4,000, for the son of this farmer, who also farms largely. If the tenant has found and raised capital enough to increase the live stock and manure the soil, the landlord has been wise enough to provide the necessary accommodation and shelter for them. I will give also a spirited instance of recent judicious improvement on the part of a landlord. A merchant, who had realized a fortune in our colonies, and understood sheep, purchased an estate of 4,000 acres, in a county north of London, for which he paid some £130,000 or £140,000. It was a noble property, but, like many such, neglected, unimproved, and, consequently, low rented. The land, a rich stiff clay, on the banks of the Thames, but undrained, and, consequently, unprofitable. Most of it was in pasture. The owner is draining the whole of it four feet deep, eighteen feet apart, and when I visited the property a heavy stream of water was flowing from the aggregated drains—all top, or rain water. The result may be easily anticipated: the fine Lincoln sheep, which now thrive upon it, give evidence of its altered condition, and will pay a doubled rental. The same gentleman has thrown down the crooked fences, trimmed those that remained, improved the roads and buildings, and deepened the cultivation on the arable by steam power; in other words, the rental will be £8,000 per annum instead of £4,000. The whole drainage will be completed in three years, at an expense of £30,000, or something over £7 per acre: probably not less than £50,000 will be the total investment in improvements. The increase of roots and winter food by this operation is already surprising. There is nothing in our history more contemptible in the eyes of a commercial man than the frequent and futile attempts of our governors and legislators to fix the value of commodities, whether by bounties or protection. Such attempts have invariably failed, as will be seen by the fluctuating prices and quantities of corn exported and imported, of which I annex tables:

Import and Export of Foreign Wheat and Flour.—Statement of the Total Quantities of Wheat and Wheat Flour Imported into and Exported from Great Britain in each Year, from 1697 to 1846:—

Years.	Imported	Exported	Years.	Imported.	Exported.
	Qrs.	Qrs.		Qrs.	Qrs.
1697	400	14,698	1772	25,474	6,959
1698	1,689	6,886	1773	56,857	7,637
1699	486	557	1774	289,149	15,928
1700	5	49,057	1775	560,988	91,037
1701	1	98,324	1776	20,578	210,664
1702	—	90,230	1777	233,323	87,686
1703	50	106,615	1778	106,394	141,070
1704	2	90,314	1779	5,039	232,261
1705	—	96,185	1780	3,915	224,059
1706	77	188,332	1781	159,866	103,021
1707	—	174,155	1782	80,695	145,152
1708	86	83,969	1783	584,183	51,945
1709	1,552	71,618	1784	216,947	89,288
1710	400	16,607	1785	110,863	132,685
1711	—	80,941	1786	51,463	205,466
1712	—	148,539	1787	59,339	120,936
1713	—	179,969	1788	148,710	82,571
1714	16	180,665	1789	112,656	140,014
1715	—	173,237	1790	222,577	80,892
1716	—	75,876	1791	469,056	70,626
1717	—	25,637	1792	22,417	300,278
1718	—	74,381	1793	490,398	76,869
1719	20	130,533	1794	327,902	155,048
1720	—	84,343	1795	313,793	18,836
1721	—	82,748	1796	879,200	24,679
1722	—	178,915	1797	461,767	54,525
1723	—	158,082	1798	396,721	59,782
1724	148	247,162	1799	463,185	39,362
1725	12	211,175	1800	1,264,520	22,013
1726	—	143,626	1801	1,424,765	28,466
1727	—	31,030	1802	647,663	140,304
1728	74,574	3,935	1803	373,725	76,580
1729	40,315	18,993	1804	461,140	63,073
1730	76	94,530	1805	920,834	77,955
1731	4	130,650	1806	310,342	29,566
1732	—	202,612	1807	404,946	25,113
1733	7	427,425	1808	81,889	98,005
1734	7	498,747	1809	455,987	31,278
1735	9	155,280	1810	1,567,126	75,785
1736	18	118,218	1811	336,131	97,765
1737	32	466,671	1812	290,710	46,325
1738	3	588,284	1813	559,000	133,441
1739	23	285,492	1814	852,567	111,477
1740	5,469	54,391	1815	194,931	227,947
1741	7,540	45,417	1816	210,861	121,611
1742	1	296,698	1817	1,030,830	317,534
1743	3	375,979	1818	1,556,031	58,668
1744	2	234,274	1819	471,697	44,689
1745	8	325,340	1820	591,732	94,657
1746	—	131,105	1821	137,684	169,846
1747	—	270,491	1822	47,598	160,499
1748	6	545,240	1823	23,951	145,751
1749	382	631,007	1824	85,183	61,683
1750	280	950,483	1825	391,588	38,796
1751	3	662,957	1826	582,276	20,054
1752	—	430,117	1827	306,615	57,323
1753	—	300,754	1828	757,716	76,489
1754	201	356,781	1829	1,670,602	75,097
1755	—	237,466	1830	1,676,034	37,149
1756	5	102,752	1831	2,310,340	65,875
1757	141,562	11,545	1832	681,765	289,568
1758	20,353	9,234	1833	322,256	96,222
1759	162	227,641	1834	201,982	159,482
1760	3	393,614	1835	89,035	134,076
1761	—	441,956	1836	264,400	256,978
1762	56	295,385	1837	575,027	308,420
1763	72	429,538	1838	1,380,817	158,621
1764	1	396,857	1839	2,852,398	42,512
1765	104,547	167,126	1840	2,352,206	87,242
1766	11,020	164,939	1841	2,691,555	30,390
1767	497,905	5,071	1842	2,916,835	175,958
1768	349,268	7,433	1843	1,064,942	90,679
1769	4,378	49,892	1844	1,379,261	76,285
1770	34	75,449	1845	1,142,927	59,841
1771	2,510	10,089	1846	2,351,908	132,768

The Future of Agriculture.—Steam.—It is impossible to overrate the enormous impetus given to every industrial, and, indeed, to every mental occupation, by the invention of steam power. Some of my views on this subject having been already laid before you in my paper read last year, I will not recapitulate them. To withdraw steam power from us would be to plunge this country into ignorance, poverty, and disorganization. Agriculture is only on the threshold of the use of steam power. She has neither cheapened her productions, nor supplied the wants of her customers. It is no exaggeration to expect that every farm of 100 acres will give employment to four horses of steam power. When this takes place, a large area of land used to feed our horses will be set free for the production of human food. I also venture to predict that great commercial companies will be formed, who will purchase estates, parcel them out with topographical economy, and connect them with the towns and cities, whose sewage they will economise. We shall then see our agricultural engines gliding along a line of rails from farm to farm and city to city, drawing the produce to market—cultivating the farm. To see the powerful monster drawn by horses along the common road is an insult to mechanical common sense, and, could the engine speak, would receive his indignant condemnation. When the locomotive was invented, somebody found means to expend £300,000,000 to make a suitable road for it, and somebody will, some day, do the same for steam in agriculture. The future of British agriculture may be said to rest upon the sufficient use of that cheap and untiring power which has given such an enormous development to almost every branch of our national industry except agriculture. Steam, whether for cultivation or for the manipulations necessary in a well conducted homestead, for draining the swamps and irrigating the hills, and, above all, for applying town sewage to our pastures, green crops, and root crops, will become the sheet anchor of British agriculture; and it is by this economy that the British farmer will be strengthened in his competition with other corn-producing countries. That great man, Baron Liebig, has revealed to us the mysteries of our subsoil—that subsoil into which the British plough has never yet penetrated. His researches raise a doubt whether it is possible to manure the subsoil through the cultivated top soil; if so, which I believe, how all important it must be to bring the manure, the air, and the subsoil into immediate contact and admixture with the surface soil. But, in any case, let us seek in our subsoil, by means of steam, that treasure which the old farmer told his sons to dig for.

Public Companies for improving Agriculture.—Assuming and believing that great and comprehensive improvements in agriculture will originate with public companies, I prognosticate that a combined system of irrigation—town sewage irrigation—and railroad transit must form an important feature of any great district operation. The principles of drainage, steam cultivation, covered buildings, steam machinery, &c., so well understood by our agricultural engineers and surveyors, would naturally form a portion of every such improvement. "But," said a farming friend of mine, as we discussed this question of connecting farms and towns by rail, "how can you expect to do this? Mr. So-and-so would not listen to such a proposition, and his landlord would not like his farm altered and cut about." I reply there is no cure for prejudice like a public company and an Act of Parliament. At this very moment, regardless of affections and prejudices in favour of old residences and old customs, our new Railway Companies are, by Acts of Parliament, levelling whole streets and squares of houses, overlapping, undermining, destroying, and reconstructing, with a hardheartedness yet unknown to British landholders and British tenants. I hope the time is fast approaching when great associated companies of city merchants and rich agriculturists will expend enormous sums in the purchase and reconstruction of estates, making them subservient to the one grand object of an economical use of steam power for almost every farming operation, including sewage irrigation. We shall then not have the mortification to know that it is possible to carry coals at three farthings a ton per mile, at 20 miles per hour on a railway (formed at enormous cost, and still paying Consols interest to its shareholders), while our farm produce on the common road costs us 8d. per mile, and crawls along at a snail's pace. When estates

and farmeries have been so improved by public companies, farmers will be found willing to pay a doubled or a tripled rental, provided they see that such increased rent only represents a fair interest on the necessary improvements; and such estates, or portions of them, would readily find purchasers. We all know that farmers like to hold under public bodies (such as Charities, &c.), because their tenure is more secure, and they are more free from personal or political interference or caprice than when holding under a single individual. I have no doubt that Parliament will some day so facilitate the registration and transference or exchange of lands, that public companies may be found to deal with land improvements. It seems odd that, while hundreds of millions of capital flow into almost every other channel, British or foreign, agriculture has not been dealt with, except lately, on a limited but beneficial scale, by the "Land Drainage" and "Land Improvement" Companies. When I suggest public companies, I mean that they should do, on a large scale and with immense resources, that which it would be impossible for individuals to accomplish, and, having made all necessary improvements, sell or let the various farms so improved.

Land Drainage.—It would be an insult to this Club to enter into details on this now well understood subject. Its influence on the quality and quantity of the food of the people is, over a large area, enormous; but still non-drainage is the rule, and drainage the exception. In this respect there is a grand future for agricultural improvement. Land drainage was practised in Essex and Suffolk one hundred and twenty years ago, on hard chalky clays, and mixed or friable soils, and no doubt greatly increased the produce and reputation of those counties as grain producers. Strange, however, to say, it is hard to make farmers believe that in the tenacious (birdlime-like) collapsing clays, drainage is of any use, and there is consequently an enormous extent of such soils undrained in Essex and elsewhere. It is easy to understand that this prejudice arose from the impossibility of using with advantage in such soils bushes or straw, the only draining materials formerly in use—these butter-like soils collapsing and stopping such drains; but now that we have tiles for making pipes or tubes, no such danger need be apprehended, and I hope our friends will soon give up their prejudices, and so fill their pockets. Honourable mention must be made of the names of Elington, Smith of Deanston, Josiah Parkes, Bailey Denton, and Clutterbuck, in connection with the science of this art. Scotland was seventy years behind Essex and Suffolk in this matter of drainage, but then our Scotch friends did it in earnest, and have connected with it deep cultivation and subsoil cultivation, and in this respect are in advance of English agriculturists. Scotland owes to James Smith, of Deanston, her drainage and deeper cultivation, and an early appreciation of the value of town sewage. I had the pleasure to know this useful man, and his views agreed with my own, that we were still only on the threshold of agricultural perfection.

River Reform. so ably descanted on by Mr. J. Algernon Clarke, will surely soon make its way. In former times, when our daily bread depended on the action of our water-mills, the law was strained in favour of the miller, who may be said to have occasionally, and not unfrequently, used the adjoining lands as reservoirs of water from the river, to the ruin or injury of the said lands; but now that mighty steam has insured to us, at all seasons, a comfortable loaf, a change is taking place, and the Judges have recently, in a most important issue, ruled that the unseen water in the land is the property of the landholder, and that even if sinking wells and using the water should dry up a river by diverting subterraneously its waters, no action would lie. Open ditches, or rivulets leading to a river, must, however, be still respected. This decision must lead to most important results, enabling landowners to dry or lower the level of the water in their soil, and use it for irrigation if desirable.

Tenant-Right and Leases.—The history of the past shows that the former violent fluctuations in prices acted as a bar to security of tenure by lease: no landlord or tenant believed in an average of prices. Without going into the question of Free Trade, our Tithe Commutation Act has afforded us something like an approximation of averages

over a given period. Let us hope that the words "average 56s. per quarter for wheats" may give confidence in leases: it is certain that without leases no tenant will invest his capital in improvements, unless secured a tenant-right for such investments. The Scotch 19 years' lease appears to ensure a good improving tenantry, and a large increase of rental at the end of the term. In Essex, a man without a lease may expend £20 an acre in drainage, chalking, and other improvement, and if he dies, and the farm be given up, not a shilling of it would come to his executors.

The Labour Question.—Labour is silently, but surely, slipping away from agriculture to the better food and higher pay of other industrial occupations. The parliamentary and excursion trains have provided a quick and cheap transit, and so have our coasting steamers. The new implemental requirements of agriculture, both British and foreign, have absorbed many a farm labourer; and the almost unobserved but regular transmission of the same class to distant colonies, by the Emigration Commissioners, also tells upon the farmer's labour store. This is well for the country, for necessity is the mother of invention; and agriculture may be more readily impelled by need than by persuasion to resort to that mighty power which has enriched our manufacturers. Experience has taught us that, as farm labourers come in contact with manufacturing towns or cities, they can only be retained on the farm by an increase of wages; our southern and non-manufacturing districts will not, therefore, long retain cheap labourers, especially now that the penny press makes them acquainted with the money advantages of an employment elsewhere.

The Labourer's Condition and Cottage.—The labourer being the most important tool in agriculture, it is desirable that he should be sharp and well polished, as well as strong. This has not hitherto been sufficiently attended to, but it must very soon be. The schools now gradually erecting will enable the rising generation to read the instructions for cleansing, repairing, and managing the steam engines which agriculture must put up. They will also be able to read their Bible and their penny newspaper; probably hereafter they may be not thought unworthy of local libraries and literary institutions, also baths and wash-houses. The extension or abolition of the law of settlement will destroy the old selfish and unfeeling practice of foisting on your neighbour, in his old age or affliction, the man whose labours, in his youthful vigour, contributed to your wealth. The landlords are beginning to believe that the indecent propinquity of crowded bed-rooms, added to the evil sanitary results of insufficient house room, tell indirectly, but most unfavourably, on their pecuniary interests. The profit from good labourers' cottages must always be, in some degree, indirect.

Meat-making.—Future advances in agriculture will, I venture to predict, be based upon and identified with the production of a much larger acreable quantity of meat than we at present produce. The constant increasing prices of meat plainly testify that demand is exceeding supply, and that foreign nations cannot make up the deficiency. Our acreable area being limited by the ocean, the only means of doing this must be the extensive use of purchased food and manures, and by the economy of the sewage of our towns. The consequence of this improved system will be felt in our grain crops; for the more meat you produce, the more manure you make, and, consequently, the more corn per acre you will grow on the arable portion. This production of more meat will necessitate a better knowledge of the mode of producing it, having regard to a profitable result.

The future Character of Farm Residences and Farmeries.—It is notorious that if you are to have for your tenants men of capital and intelligence, their residences must be suitable to their intelligence and means. I know practically, and it is notorious, that on many of our large south country farms the residences are totally unfit for such a class of men; who, I believe, would willingly pay an increased rental for such necessary accommodation. The landlords of such farmers are therefore obliged to put up with men of inferior capital and intelligence. Surely a farmer of 700 acres, with a capital of £10,000, should not be less favourably housed than a merchant or a trader,

"Burn your Clay into Brickdust," will be a motto with every heavy land farmer. I know one who for years has continued burning a clay hill. It provides him with healthy bedding for his stock, and with alkalies for his root crops. It permits him to consume his straw in food, instead of wasting it under foot. It renders his land friable and more economical to work; and it has thus largely increased his green crops and profits. This is also my experience in the matter.

With regard to our Homesteads or Farmeries.—The time will come when we shall see them like factories or railway stations, warmed in cold weather, lighted with gas; the manure well cared for, unwashed, and with its full powers preserved. These things are all necessary to the cheap and abundant production of meat and bread for the British people. It is of no use to cry out, Where is the capital to come from? It will be found, as it has been found, when the requirements of the times and the increasing intelligence of landlords and farmers shall have given the subject due consideration. Let the system be introduced by those who are able and willing, and let it be found to be profitable, and then the rising generation will grow up with its acceptance, free from the doubts and disbeliefs of their forefathers, who had not had practical evidence of its advantages.

In Conclusion, it is a great mistake to suppose that farmers are naturally more prejudiced than other men. It must be remembered that it has been their misfortune, and not their fault, that the difficulty of intercourse prevented those examinations and comparisons which the railroads and literature of recent times have permitted them to make. That there exists a most creditable desire to avail of such opportunities has been abundantly proved by their overwhelming attendance at the great annual and other exhibitions of stock and machinery. My object in reading this paper has been, not to find fault, but to stimulate. I know the difficulties of agriculture: I know that we cannot control the seasons; but we may, by improvements, so moderate their ill effects as to avoid those famines and sufferings which, in less favoured times, afflicted this happy country. For the future let agricultural assume more of the manufacturing character; and let the question be, not what it costs, but what it will pay, to effect agricultural improvement.

EVENTS HAVING A PROGRESSIVE INFLUENCE ON BRITISH AGRICULTURE.

Societies for the Promotion of Agriculture.—The Highland Society, and the Smithfield Club (1784); the Royal Agricultural Society of England (1838); the Royal Agricultural Society of Ireland (1841); the London Central Farmers' Club, the first farmers' club, the gradual establishment of local farmers' clubs and county agricultural societies (1843); the Board of Agriculture (incorporated) was established by Sir John Sinclair, and had Arthur Young for its secretary (1793); Annals of Agriculture commenced (1784) by Arthur Young, and continued until 1808; the two great agricultural fêtes of this period (1784)—the sheep shearings at Holkham and Woburn, at which hundreds of the most eminent of the kingdom were annually assembled—were also serviceable in stimulating the national taste in favour of agriculture.

New Plants previously Unknown in Britain.—Hops from the Netherlands (1524); potatoes introduced into England by Sir Walter Raleigh (1700), a government premium given as an encouragement to their cultivation—first in Scotland in 1739, and became general there in 1760 to 1780; white turnips (Norfolk whites) used by Lord Townshend (1730); swedes grown in East Lothian (1781); garden turnips were known in the reign of Henry VIII.; broad clover known in Scotland (1740); Italian rye-grass in Scotland (1700 to 1732); clover hybridum, W. Stephens (1834); clover incarnatum, Eilman (1821); clover pratense (1645); clover perennium (1707); clover repens: in Scotland, where heat is removed and lime is applied, it springs up spontaneously (1707); mangel wurzel (1810), introduction due to Dr. Lettsom, most important as a root for heavy clays. Sainfoin and lucern followed the introduction of clover.

Artificial Manures.—Bones used by Mr. Watson of Keillor (1821): Mr. Stevenson, of the *North British Agriculturist*, says that they were known to be agriculturally useful at the end of the last century; superphosphate of lime (1841); rape dust, known in Scotland as a valuable manure (1820 to 1828); guano: half cwt. brought from Liverpool to Scotland, and sold at 6d. per lb. (1829); three cwt. brought (1831); guano first used in quantity (1841-42): some idea may be formed of the quantity now used, when it is stated in the *Times* of this day (2nd Feb. 1861), that Messrs. Gibbs and Co. paid last year at Liverpool £7,000, being at the rate of only 3d. per ton, with the addition of dock dues. Marl, used before the Roman invasion; woollen rags; blood and offal; ground coprolites; fish manure, starfish, sprats and mussels.

Artificial Foods.—Linseed, linseedcake, rape cakes, nut-cakes, cottonseed-cakes—I first used some about 1856-7—locust beans, Indian corn, rice, Dara lentils, Egyptian beans, dates, and a variety of other foreign productions.

Legislative Acts.—Free importation of foreign corn (1847); free importation of foreign animals (1841); the New Poor-Law (1834); the General Board of Health (1848); Enclosure Commission (1845); The Emigration Commission (1825); the Tithe Commutation Act (1836); the Copyhold Enfranchisement Act (1841); the Penny Post—Sir Rowland Hill (1840); the Land Drainage Company; the Lands Improvement Company; Government Drainage Loans: the first act was passed in August, 1846, and a grant for England and Scotland for a period of 22 years, at 6½ per cent., was for £2,000,000, and for Ireland £1,000,000. The demand for Scotland was very great, as much as £40,000 by a single proprietor; but early in the session of 1847 an act was passed limiting the amount to any one proprietor to £10,000. In 1849 the whole money was applied for and granted, and an act passed for enabling companies or private parties to advance money. In 1850 another act was passed, making an additional grant for England and Scotland of £2,000,000, and for Ireland of £200,000, but limiting the one to any one applicant to £5,000, including previous grants—a pretty clear proof of the anxiety for improvement by drainage. An act passed for obtaining outfalls in 1847.

Implemental Inventions.—The drill—Jethro Tull, the horse-hoe, ditto (1740); the thrashing machine and fixed beaters (1793), by Meikle (Scotland), in use sixty years at Clackmannan; the reaping machine (1827), by the Rev. Patrick Bell (Scotland), who is still living; the dibbling machine, by the Rev. J. Cooke (1788); the Americanized Bell's reapers, made by McCormick and Hussey (1856); the first agricultural portable steam-engine invented and made by Davies of Birmingham, the grass-mowing machine introduced from America, pipe-making machines (Clayton and others), first draining tiliery established (1841); Fowler's steam draining plough, Fowler's steam cultivating plough, Smith's (of Woolston) system of steam cultivation; winnowing machine introduced from Holland into Scotland, and publicly denounced from the pulpit (1710).

Literary Events.—The art of printing; Caslon's tyed manufacture; the printing and circulation of agricultural newspapers and magazines—Roffe's Farmers' Journal (about 1790); the first English work on agriculture (1534) entitled "The Boke of Husbandrie" 100 pages, by Sir Anthony Fitzherbert, Chief Justice of the Common Pleas in the time of Henry VIII.; the second was by Thomas Tusser, an Essex man, born 1527, who farmed at Rivenhall, about six miles from Tiptree; Jethro Tull—Arthur Young, also an Essex man (1740); the "Annals of Agriculture," commenced by Arthur Young (1784), and continued until 1808; the Journals of the Highland Society and of the Royal Agricultural Society of England; the works of Morton, Stephens, Low, Loudon, Huxtable, Smith, Hewitt Davis, Caird, Rham, and Pusey.

General Events.—Turnpike roads, canals; railroads Manchester and Liverpool (1830); the spinning jenny, the mule, the power loom; the steam-engine as applied to manufactures, mining, and river and ocean navigation; the electric telegraph (1837); steam navigation first boat built on the Clyde (1801).

*Fluctuation in the Imperial Average Price of Wheat, annually,
from 1641 to 1860.*

Year.	Price per qr. s.	Year.	Price per qr. s.	Year.	Price per qr. s.	Year.	Price per qr. s.
1641...	57	1696...	63	1751...	34	1806...	79
1642...	60	1697...	54	1752...	37	1807...	76
1643...	60	1698...	61	1753...	40	1808...	82
1644...	61	1699...	57	1754...	31	1809...	98
1645...	51	1700...	36	1755...	30	1810...	107
1646...	43	1701...	34	1756...	40	1811...	95
1647...	66	1702...	26	1757...	54	1812...	127
1648...	76	1703...	32	1758...	44	1813...	110
1649...	71	1704...	42	1759...	35	1814...	75
1650...	63	1705...	27	1760...	33	1815...	66
1651...	65	1706...	23	1761...	27	1816...	79
1652...	44	1707...	25	1762...	35	1817...	97
1653...	31	1708...	37	1763...	36	1818...	86
1654...	23	1709...	70	1764...	42	1819...	75
1655...	30	1710...	69	1765...	48	1820...	68
1656...	38	1711...	48	1766...	43	1821...	56
1657...	42	1712...	41	1767...	48	1822...	45
1658...	58	1713...	45	1768...	54	1823...	54
1659...	59	1714...	44	1769...	41	1824...	64
1660...	50	1715...	38	1770...	44	1825...	69
1661...	62	1716...	42	1771...	47	1826...	59
1662...	66	1717...	40	1772...	51	1827...	59
1663...	51	1718...	34	1773...	51	1828...	61
1664...	36	1719...	31	1774...	53	1829...	66
1665...	44	1720...	33	1775...	49	1830...	64
1666...	32	1721...	33	1776...	38	1831...	67
1667...	32	1722...	32	1777...	46	1832...	59
1668...	36	1723...	31	1778...	42	1833...	53
1669...	40	1724...	33	1779...	34	1834...	46
1670...	37	1725...	43	1780...	36	1835...	40
1671...	33	1726...	41	1781...	45	1836...	40
1672...	37	1727...	38	1782...	48	1837...	56
1673...	42	1728...	48	1783...	53	1838...	65
1674...	61	1729...	42	1784...	49	1839...	71
1675...	58	1730...	32	1785...	52	1840...	67
1676...	34	1731...	29	1786...	39	1841...	65
1677...	38	1732...	24	1787...	41	1842...	58
1678...	53	1733...	25	1788...	45	1843...	50
1679...	54	1734...	31	1789...	51	1844...	51
1680...	40	1735...	38	1790...	55	1845...	51
1681...	41	1736...	36	1791...	49	1846...	55
1682...	39	1737...	34	1792...	43	1847...	70
1683...	36	1738...	31	1793...	49	1848...	51
1684...	39	1739...	34	1794...	52	1849...	45
1685...	41	1740...	45	1795...	75	1850...	41
1686...	30	1741...	42	1796...	79	1851...	39
1687...	23	1742...	30	1797...	54	1852...	41
1688...	41	1743...	22	1798...	52	1853...	53
1689...	27	1744...	22	1799...	69	1854...	73
1690...	31	1745...	25	1800...	114	1855...	75
1691...	30	1746...	35	1801...	120	1856...	69
1692...	41	1747...	31	1802...	70	1857...	57
1693...	60	1748...	33	1803...	59	1858...	44
1694...	57	1749...	33	1804...	62	1859...	44
1695...	47	1750...	29	1805...	90	1860...	53

Mr. BRADSHAW (Knowle, Guildford) said, in the few remarks he was about to make, he would endeavour to confine himself strictly to the subject, namely, "The past, present, and future of British agriculture." As regarded the past, he would not add anything to what Mr. Mechi had stated. He would only refer to the present, to assist him in the bold step he was about to take in predicting the future. As to the future, he for one was not inclined to hold out a gloomy prospect to the tillers of the soil; but, on the contrary, a cheerful one (Hear, hear). Let them look at the progress which agriculture had made in the last fifteen years, and ask themselves why it should not make similar progress in the next fifteen (Hear, hear)? In glancing at the discussions of agricultural societies, and reading the productions in agricultural journals, he found evidence that at the present day there was far more practical intelligence among farmers than existed fifteen years back; while, as regarded the artificial manures, what had been witnessed? During the interval which had elapsed, and the

various nostrums which had been presented, he believed that the chaff had now been for the most part separated from the grain, and that the substantial portions of modern discoveries in that respect remained for the benefit of agriculture (Hear, hear). Then, again, like the introducer of the subject, he looked forward to a vast improvement of agriculture from the employment of steam. There were two elements embodied in this question; one being the power of production, the other that of consumption. The cultivator of the soil had now great facilities for travelling about from place to place by means of railways, and, away from home, his mind was naturally occupied in observing what was done by others: he was thus led to adopt such improvements as appeared most applicable to his own case; and he believed that one result of this locomotion and observation would be the discovery that steam cultivation would promote cheapness of production and increased quantity and quality—that it would be beneficial to the owner of the soil, better for the farmers, the agricultural labourers, and the whole community (cheers). He would not on that occasion enlarge on the merits of the discoveries of Mr. Fowler and Mr. Smith; he would simply remark that, in his opinion, the agricultural world was greatly indebted to the presence of those gentlemen. They were living in days of great transition. The men of the present day were quick to discover whether mutton or wool would yield the greatest return for their exertions, and they would act accordingly. There were not less than 4,000,000 people in this country who were dependent on manufactures, and the machinery and mining connected with that branch of industry; and these people, being in a state of great prosperity, required not a Leicester sheep, but a light Southdown. The prosperity of agriculture depended on the success of their efforts to produce and the capacity of consumption on the part of the community. On the former point he had already intimated his opinion; and as regarded the capacity of consumption, he believed it would not only be maintained, but would continue to increase.

Lord BERNERS said, in response to the appeal of the Chairman, he had great pleasure in handing in the name of Sir Brook Brydges, M.P. for the county of Kent, as a new member of that Club (cheers). He had also put down the name of another person, a relative of his own, which he trusted would be acceptable. He could not help saying that he felt great interest in the announcement of the paper which had been read by the worthy alderman; and he had been much gratified by the research which he had shown in dealing with the subject. He should certainly have been more gratified had the last part of the subject—"the future of agriculture"—been more dilated upon; for what most interested all of them on such occasions was to hear from their brother-farmers something which bore upon their prospects. There were one or two points on which he did not quite agree with the worthy alderman. He thought, for example, that he was a little mistaken when he spoke of those who were connected with agriculture as smaller in number than those who were connected with manufactures. If his memory served him, it was shown that the former paid nine-tenths of the burdens of the country. He was very glad that the question of settlements and payments under the Poor-law had been taken up by the Club. He believed that the present system of settlements was a great injury to the poor man, and that the area of rating ought to be extended as soon as possible (Hear, hear). He might remark, that in former days being connected with a close parish, or, rather, several close parishes, he fancied that he did his duty if he saw that every man within that district was well clothed, well fed, well employed, and well housed; but when he examined the question a few years ago, he felt that he was very far from doing his duty; that in this matter they ought to look, not to their own parishes merely, but to the general welfare of the poor of this country (Hear, hear). In conversations which he had with the Poor-law Commissioners, and from the reports which they issued, he found that in Suffolk and Cambridgeshire, within one or two miles of model parishes, where there was everything that was conducive to comfort and morality, were to be found other parishes where the state of things was the very opposite. That led him to turn his attention to this matter, and the result was that he determined to do his utmost to secure an extension of the area of rating. As regarded their future

prospects as agriculturists, he thought it would be extremely interesting to hear from some of the practical men present what they were about to do in the way of providing a substitute for the deficiency in the crop this year (Hear, hear). In his own part of the country scarcely any regular ploughing was done in October, and consequently many of the stubbles were quite unprepared for wheat. One impression produced on his mind by what he witnessed last autumn, was, that on account of the various other changes which had taken place, it was necessary to make a change in the rotation of cropping (Hear, hear). He now saw, that instead of its being desirable in all cases to adhere to the four-course system, and grow wheat alternately with other crops, there were certain districts where it would be better not to grow wheat at all, and where oats and barley might advantageously be substituted for it. This was a point which he considered well worthy of consideration (Hear, hear).

Mr. BAILEY DENTON (Stevenage) had to remark on a subject which was embraced in the able paper which had been read, and a point with which he was familiar. He meant the law relating to the drainage of lands. Alderman Mechi said he thought the most recent decision was favourable to the drainage of lands. He (Mr. Denton) was sorry to say that such was not the case. The decision of Mr. Baron Alderson gave a man a right to drain his own land if there were no defined channel and no constant spring; whereas, on the contrary, by the recent decision of Vice-Chancellor Stuart, it was declared that no man could be allowed to extract underground-water from the land if it might be fairly assumed to be passing from a higher to a lower level. That was a most important decision as affecting draining in modern days, and therefore he had thought it right to mention it.

Alderman MECCHI said the first decision relating to the river Wandle was given by the twelve judges. He wished to know whether it had been upset?

Mr. B. DENTON replied that it had not been upset, but Vice-Chancellor Stuart had given a more recent decision in opposition to it.

Mr. T. OWEN (Clapton) shared in the disappointment which had been expressed that Mr. Mechi had said little or nothing about the future. The past was gone and could not be recalled; the present they knew was every day improving; what it most concerned them to consider was the future. He rejoiced to hear Lord Berners express the opinion that it must change the system of cultivation. He was glad to hear that noble lord say, in effect, that a departure from the old four-course system was desirable in order that farmers might have wider scope for improvement, and he trusted that other landlords would be found following his example. They all knew what great improvements were offered by machinery. One of the most important questions for the farmer in reference to the future was what his farm was best adapted for, whether for stock or for corn, and he hoped that landlords would give their tenants opportunities of farming in the manner which was most beneficial to them. (Hear, hear.)

Mr. G. SHACKEL (Ereleigh Court, Reading) said there were several points connected with the future, which as agriculturists it became them to consider well. In the first place he had no doubt that many farmers present had found, as he did, that their expenses were gradually increasing in various departments of outlay (Hear, hear), concurrently with which there was an increasing scarcity of labour. In the county to which he himself belonged, namely, Berkshire—and the case was the same elsewhere—the taxation, both general and local, was becoming increasingly heavy. They were constantly being called upon to contribute to one expense or another, and the matter had now assumed a very serious aspect. As these burdens were increasing at such a rate, they must devise means of augmenting their production proportionately. A foreman whom he employed on his farm once remarked to him "Master, your expenses seem to be always increasing, and how is it that, while you lay out so much money on oilcake and other artificial manures, you don't crop and produce more?" (Hear, hear). Well, that led him to turn his attention to the matter. Since that time—the remark was made four years ago—he had learnt to produce by his four-field system corn enough for his horses, and he still adhered to that mode of proceeding. He farmed upon a warm gravel soil, and hence, perhaps, could do

more than many gentlemen present. He could produce a turnip crop after oats. His cultivation was increasing, and he felt that he must endeavour to make up for a deficiency of labour by having recourse to steam and to improved machinery. It was no use for farmers to sit still and wish for improvements: they must endeavour to bring every available improvement into practical operation. He believed that steam ploughs would one day be almost as common as thrashing machines were at present; and he thought it highly desirable that the noble landlords and wealthy men to be found in many districts should turn their attention to the introduction of steam ploughs on their farms, as Mr. Benyon, the member for Berks, had done in that county. He was quite sure that it was to improved implements, steam machinery, and artificial manures, used with judgment, blended with strict economy, that they must look, to enable them to pay their future expenses, and obtain a fair return.

Mr. J. A. NOCKOLDS (Stansted, Essex) said, Alderman Mechi had reminded them that, if they would have a greater command of machinery and steam-power, they must endeavour to promote education and intelligence among labourers, and that there must be an improvement in labourers' cottages. To this he would add, that homesteads must be better adapted to modern requirements, and there must be proper facilities for sheltering machinery—there was great need of improvement in that respect. Even the great model homesteads were no longer applicable to the future of agriculture.

Mr. G. DOBITO (Croyley Grove, Newmarket) would be glad if the worthy alderman would state on what authority he alleged that nine-tenths of the people of this country were engaged in manufactures (Hear, hear).

Mr. J. COLEMAN (Park Farm, Woburn) thought it probable that some persons had been drawn there in the expectation of having a chance shot at the worthy alderman (laughter). On that occasion, however, he had thrown oil on the troubled waters; and there was very little in his paper with which any practical farmer could find fault (Hear, hear). As regarded steam-cultivation, the question was one of production; and it was for farmers to consider whether they would incur a certain outlay in order to obtain two quarters of wheat where hitherto they had got only one. The practical farmer, whose letter Alderman Mechi had read, had, he believed, done more to promote steam-cultivation than all the landlords of this country. Tenant-farmers would pay more attention to the words of one of their own class than to the advice of landlords. In such matters they ought to combine, and to communicate with each other. A few years ago, a system of drilling turnips with liquid-manure was placed before agriculturists. He (Mr. Coleman) procured a liquid-manure drill, and, rather unthinkingly, used guano with it; the result of which was that he spoilt thirty or forty acres of turnips. A neighbour of his afterwards told him that if he had consulted him, he could have saved him from that loss, having spoilt twenty acres of turnips in the same way in the previous year. One of the greatest obstacles to the improvement of agriculture was, that men who lived close to each other, fearing, perhaps, to expose their ignorance, kept their experience too much to themselves (Hear, hear). It was a peculiar advantage of that Club that it tended to remove that evil. He should be very glad if farmers generally would apply their minds to the question of steam-cultivation. There were many districts which would, he felt certain, be vastly benefited by the application of steam-power. There were many heavy lands that might be cultivated profitably with steam-power, although it would take all the land would produce to maintain sufficient horse-power.

Mr. J. A. WILLIAMS (Baydon) said: The paper read that evening by the worthy Alderman appeared to him more an essay on commerce than on agriculture. If we went back to the past of agriculture, it commenced when Adam was driven out from Paradise: from that time to the present, more especially of late years, it had been rapidly advancing in science; and, as his friend Mr. Shackel had observed, the past had taught them a lesson—it had taught them that the British farmer must endeavour to produce more and more. He agreed with him; but at the same time he would appeal to any one present whether, with his utmost endeavours to produce large crops in the last year, the want of sun had not beaten him?

(Hear, hear.) He was thankful to say that the year 1860 was among the past; but it might have been sent to show us that, whoever might plant and water, we were not to forget that it was God who gave the increase. If British agriculturists wanted to enter into competition with foreigners, they must endeavour to increase their productions. This would, of course, require increased powers of production, and it was for the British farmer to ascertain whether manual labour, horse, or steam power, was the most economical?

Mr. J. SANDERSON (Westminster) said, in reference to past agriculture, I agree with Mr. Mechi's views, for no doubt great allowance must be made for the many disadvantages with which the past cultivator of the soil had to contend. All those discoveries, indeed, which have given such an impulse to agriculture during the last 25 years, were, up till the commencement of the present century, unknown. There was no railway accommodation; the use of artificial manures was not known; Smith of Deanston had not discovered that system of drainage which brought in a new era in agriculture; while the then state of agricultural implements was as much inferior to the general condition of agriculture, as the present state of agricultural machinery is superior to the general condition of agriculture now. It is a matter for praise, too, to past cultivators, as it is a stigma on the farmer of the present day, that in all upland districts there is much land, which has formerly been cultivated, now lying waste. At the present time agriculture, in several departments, is making rapid progress. Farmers, availing themselves of the aids proffered by science, and, what is better, of their own field experiments, are acquiring a correct knowledge of those manures best adapted to different soils; the area under turnips, the successful cultivation of which is the basis of successful farming, is being rapidly extended; sheep, the best fertilizers of light soils, are gradually taking a more prominent place in rural economy; the practice of summer fallowing is being abandoned, and spring culture, hitherto regarded so essential for the turnip crop, is now known to be injurious, and will eventually be done away. The increasing use, too, of artificial foods and manures is a favourable sign of present agriculture; and I need not speak of the rapid advances being made in agricultural machinery, for the success of the reaping machine is now an historical fact, while that of the steam cultivator has exceeded the most sanguine anticipation. But present agriculture has its dark as well as its bright side. It is a reproach to the nation that one-fifth of the land available for cultivation has yet to be brought under the subjugation of the plough. In cultivated districts a large area is rendered valueless by small enclosures, irregular fences, and an over-abundance of isolated trees. As regards drainage, there is no doubt a laudable movement for river reform, and the deepening of water-courses, but it must be admitted that in every county in England there are thousands of acres of wet land still undrained, which in fall and out-fall presents every facility for efficient drainage. In the county of Middlesex, where the highest farming might be looked for, as it surrounds the world's metropolis, a person may travel miles before he sees a single drained field, although the land is of an undulating character, and of the wettest description. The use of lime, too—the best pulveriser of clay soils—is in several districts practically unknown. Turnip culture is only imperfectly understood in some districts, or else why such miserable roots produced in wet as well as in dry seasons? But without further enumerating present shortcomings in farming, let it suffice to say that the area under good farming bears a very small proportion to the area under bad farming. The future of agriculture has therefore a wide field for improvement. Farmers have, no doubt, the power of narrowing the limits of that field, but the greatest barriers to agricultural progress are those over which farmers have no control, for so long as the land laws—taken as a whole—are constituted as they now are, so long will agriculture be under bondage. Were the transfer of land simplified, and if long leases and equitable covenants were universally granted, landowners and farmers would be alike unfettered, their enterprise would soon overcome every remaining barrier, and an impetus would be given to British agriculture hitherto unequalled. Long leases, especially, are essential to carry out extensive improvements; while the system of yearly tenancy, viewed in itself, is injurious to landowners, stifles the energies of the farmer, and tends to lock up the resources of the soil. Much has been said to-night about steam cultivators, and improving our farm homesteads; but what interest has a farmer in these,

without security of occupation? In Scotland the system of yearly tenancy is unknown; but there is, on a few estates, what is equally injurious—short leases of seven and nine years' duration; and so marked is the difference of farming under the short leases from that under the long leases, that any experienced agriculturist could, without a previous knowledge of the circumstance, at once determine the line where long leases commence and short leases end. The proper development of the resources of the soil is therefore greatly influenced by the restriction laws referred to—hence, the necessity of improving those laws. The question is one which does not merely concern the landowner and farmer: it is one in which the interests of all classes are involved. The rapidly increasing consumption of food, consequent on a rapidly increasing population, demand the use of all available means to effect a corresponding increase of produce. Probably not less than £30,000,000 will be sent this year from this country to purchase bread food from other lands; and no one will deny that, under a proper system of agriculture, a large portion, if not all of that sum, might be saved for the extension of native industry. The subject only needs ventilation; and I believe if a survey were taken of the unimproved land and waste land—from whatever cause—in each county, and a correct estimate formed thereon, and widely circulated, of the loss this country sustains from the present system of agriculture, it would lead to a relaxation of our restrictive laws. I agree with Mr. Mechi as to agricultural improvements being remunerative. Indeed, I never knew a case where economical expenditure on land was not eventually profitable; on the contrary, I know several estates on which a comparatively small outlay doubled their value in a few years; and to show that even large outlays in improving adverse soils are remunerative, I have only to refer to Mr. Mechi, who has converted one of the most barren moors in England into a farm which maintains as many sheep per acre, produces as bulky grain and green crops as the most sanguine farmer would wish for on a naturally fertile soil.

The CHAIRMAN said he had a remark to make in reference to what had fallen from the last speaker. Some years ago, when the late Mr. Pusey and Mr. Colman, representative of the United States, made a tour of the United Kingdom, and wished to ascertain which was the best-farmed district, they came to the conclusion that that of North Lincolnshire was preferable even to the Lothians. In Lincolnshire, farmers generally had no leases, and never asked for any (Hear, hear.)

Alderman MECHE then replied. Mr. Dobito had, he remarked, asked him what authority he had for saying that only one-tenth of the population was employed in agriculture. He would refer him to Mr. James Caird's book. It was there stated that the proportion was 10 per cent., and was gradually decreasing; and he believed the author was right. Nothing that had fallen from any of the speakers that evening had at all shaken his opinion, that in view of the future they must use more steam, invest more capital, obtain covered yards, plough deep, and have greater security of tenure.

On the motion of Mr. James Howard, seconded by Lord Berners, thanks were voted to Alderman Mechi for his paper; and a similar compliment having, on the motion of Mr. J. Williams, seconded by Mr. Nockolds, been paid to the chairman, the proceedings terminated.

NEW MEMBERS.

The following gentlemen have been elected members—at the

January meeting of the committee:—

- J. B. Brown, 18, Cannon-street, City.
- J. F. Fordham, Sandon, Herts.
- J. R. Howden, 11, Chesterfield-street, Argyle-square.
- J. Carter Jonas, St. Mary's-street, Cambridge.
- E. T. Kensington, Moolham, Ilminster.
- R. Sibley, Ammables Farm, Luton.
- R. Solly, Mundon Hall, Maldon.
- J. Trask, Hingleaze, Yeovil.
- F. Twynham, Allington, Bishopstoke.
- I. Villar, Charlton-Kings, Cheltenham.

At the February meeting:—

- E. Hales, North Frith, Hadlow.
- J. G. Hobson, Long Sutton, Wisbeach.
- I. T. Lawrence, Causton, Rugby.
- C. Neame, Copton, Faversham.
- J. Rigg, 4, Chester-place, Hyde Park-square.
- H. E. Stanley, 43, Hemingford-terrace, east, Barnsbury Park,

ON THE PREPARATION OF LAND FOR WHEAT.

KINGSCOTE AGRICULTURAL ASSOCIATION.

The second meeting for the present season was recently held at Hunters' Hall. There was a full attendance of members. The subject for consideration was "On the preparation of land for wheat—its after cultivation and management up to the time of cutting," which was to have been introduced by Mr. J. Ritchie, but who was prevented attending from indisposition. He, however, sent a paper on the matter, which was read by the hon. secretary as follows:—

Sir,—In introducing to this meeting the subject just named—the preparation of land for wheat, and its after cultivation—I would observe that, in the first place there is the great difference of soils, which we have to contend with in this and all parts of the country, which makes it very difficult to prepare them all as they require, or as we would really wish to do. I will not attempt to enter into the variableness of our soils, but will class them into two sorts—light and heavy soils. In the second place, it may not be amiss to look a little to the preceding crops, along with the preparation of the land. In the third place, the time for planting, the different ways of planting, the quantity of seed required per acre, and lastly the after cultivation. We will, then, begin with the light soil, which we will say includes stone brash, gravel, chalk, and sandy soils. The rotations of crops on these soils, in a general way, are roots, barley, seeds, and wheat. The seeds on the five-field system are mown the first year, and then fed the remaining part of the year, and the following year, sometimes, in addition, with a little cake or corn. On the four-field system, the seeds are mown once—fed for a month or two, we will say, as the former, with a little cake or corn. This we will say, gentlemen, is laying a pretty good foundation for the wheat crop. There is also another way that is sometimes done; that is to mow the seeds twice in one year, and then bring the land to wheat. We would at once say the two former, not the latter. It is rather tender ground to tread upon, and I do not wish to be mistaken on this point, when I say that where a good crop of broad clover or cow grass has been mown twice in one season, but not seeded, and the land ploughed up and put to wheat, that better crops have been produced in this way than from the two former ways, even when a liberal quantity of cake or corn has been added to the feed. This seems at first sight to be contrary to common sense and reason; but I will endeavour to give an explanation from my own experience and observations. The clover and cow grass plants are strong in stalk and very leaflet, and as the stalk goes upwards, the root is also strong, and goes downwards, or spreading in the soil, and by mowing once and again the roots are still increasing in proportion, thus giving us from 50 or 60 cwt. of roots or vegetable matter per acre, and a most valuable manure for the wheat plant, and by feeding this most valuable plant we kill it, as it will not stand constant feeding. If we look at two-year-old lea when it is ploughed, we do not see any of the clover or cow grass roots; no, they are gone; but where are they gone? There was never very many there, because they were killed, as I said before, by constant feeding. But there are other crops which are very good preceding crops for the wheat crop, such as vetches, peas, and rape. The roots of the latter plant, which is also an excellent manure for the wheat, and all broad leaflet crops are good preceding crops for the

wheat crop. Now we come to the preparation of the land for the crop. On these light soils, the general mode of cultivation for one and two-year-old leas is one ploughing. This may do, if ploughed up with a good furrow, say from five to six inches in depth, and not more than nine inches wide, leaving it for a month or two before it is planted; then the drags and harrows over it will give us a sufficiency of soil to deposit the seed. But we are aware that on a great many of our light soils we have not that depth of soil, and very often it is ploughed with a furrow not more than three or four inches in depth, and from ten to twelve inches in width; and all our dragging and harrowing will not get us soil enough for the seed in this way. One good ploughing is worth two bad ones. But we will try another way; supposing we rafter our one and two-year-old leas. You all know what rafting is. It is taking out one furrow and turning it on the top of the plain surface, thus bringing the two surfaces together; let it lie in this way for a month or so. In this manner the two surfaces become in a comparatively decomposed state; then drag or harrow it down, and plough the land with not too wide a furrow. In this way we are exposing the soil to the action of the sun and air, causing a decomposition of the roots of the grasses into vegetable matter, and a greater amount we may call it of natural manuring from the atmosphere, and a good depth of soil for the seed; and when the drags and harrows come over it, the unpulverized portions of soil are brought to top, leaving us a rougher surface, which protects and shelters the plant in the winter months, and in the spring falls down and nourishes the roots of the plants. Vetches or roots being fed-off and coming in for wheat, should be rafted or skim ploughed first, by this means we mix the droppings of the sheep in our light soils, and we do not lose it so quickly as we would do with one furrow. We now come to the time of planting. It has been proved that wheat may be planted in all the months of the year except one, and that is in July. In this month it is too late to come to maturity, and too forward to stand through the winter. September, October, and November, are the three most favourable months for autumn planting. December and January are the two most dormant months in the year, and if not done before these months, it is better left till February, when vegetation begins to move again. March and the first week in April is the most favourable time for spring wheats; May and June are too late in ordinary seasons, to secure a crop. The evil of too early autumn planting is that in mild seasons the plant gets too forward, and when winter sets in it is checked. And when spring comes it does not throw out fresh roots into the soil, neither does it send forth shoots to run up; but it runs up with a weak straw, and very short, small ear. It was checked when it ought to have gone on, or it has spent itself too much, to make another vigorous start at spring. Then, as to the different ways of planting. In the first place, there is sowing broad-cast with the hand; and a good seedman and the land in a proper state to yield, the seed, with the drags and harrows, is as likely to produce a good crop as any. And sowing broad-cast with the hand, and ploughing the seed in with a light furrow when the land is rough, answers sometimes very well. Hoeing and drilling with the hand is a

very good way, when hands can be procured who understand it; but we have now got drills for the purpose, and they give us the advantage for after cultivation more than any other way. When drilling, the rows should be from eight to nine inches apart, and the seed in the soil, from one-and-a-half to two inches in depth. The best seed that we can procure, and a frequent change, is always necessary; a solution of water and vitriol, one pound per sack, we all know is a great preventive for the smut, and should not be omitted. With regard to the quantity of seed per acre. The earlier the planting, the smaller is the quantity required, and as the season advances we ought to increase the quantity according to the condition and situation of the land. The average quantity, I will say, two bushels per acre, the after-cultivation must be done as early in the spring as the weather will permit. When the plant is weak and sickly, and the land light and hollow, about three-quarters of a cwt. of either guano or nitrate of soda, and three or four cwt. of common salt, per acre, sown, and slightly harrowed over, the roller or presser following the harrows. This will almost produce an immediate effect; and when the plant is sufficiently recovered, we have but one common operation to perform—that is, using the horse or hand-hoe frequently and freely, and as long as it can be done without breaking down the stalks and injuring the plant. We are again exposing the soil to the air, and encouraging the roots of the plants to run freely into it for support, and keeping the land clean, which is of the greatest importance; for we cannot grow a crop of weeds and corn, both at the same time, with a profit. We now come to the heavy soils, such as stiff clay, and deep, strong, loamy soils. Beans, peas, vetches, rape, clover, and cow-grass, are good preceding crops, on these strong soils, for the wheat. The bean and pea crops ought to be well horse and hand-hoed, so that the land is kept clean and well pulverised. It then requires less labour for the wheat. Vetches and roots should be fed off early, in order to give time to prepare the land. Clover and cow-grass, when a good plant, ought always to be mown, not fed; for on these strong soils heavier crops are grown than on the light soils, therefore leaving us a greater amount of manure in roots. To seed this plant, takes away the most valuable part of our manure from the roots, in the seed; as, in feeding, it is carried off in mutton and bone. Early raftering, and deep ploughing, eight or nine inches in depth; subsoil ploughing to the depth of four or five inches, under the nine-inch furrow, will pay, once in every six or seven years, for the wheat crop alone. This gives us a depth of soil of thirteen or fourteen inches for the air to pass into, which will often be as effectual as a liberal dressing of manure; for the active ingredients of the air are absorbed by the soil, and made use of by the plant. It is certain that the deeper and oftener we move and expose these strong soils to the action of the air, the greater amount of natural manure we receive. But I am speaking of soils that are porous enough for water to pass, or have been made so by thorough drainage, under this deep cultivation; for if it is not so, the first heavy rain that comes fills all the pores of the soil with water, and, if it cannot pass away, it becomes stagnant, and leaves our land in a worse state than it was in before. As to the time of planting, and the different ways, the quantity of seed is much the same as on the light soils, not forgetting the situation and condition of land. The after-cultivation we cannot vary much from the light soils, with the exception of rolling or pressing, which is not often required on these strong soils. The horse or hand-hoe may be used to a greater depth, with more effect than on the light soils. In conclusion, I say the more we study Nature, and

assist her as much as we can, it is certain she will repay us for all our labour.

Mr. E. DREW said: I quite agree with Mr. Ritchie as to the great difference existing in the soils of this country, and no doubt there is a great difference in the climate also, which affects the subject under consideration. These causes, I am fully aware, render it next to impossible to lay down any one system for general adoption. I think, however, the way in which he has classed them, viz., of light and heavy soils, is sufficient for our purpose. That the subject is one of great interest and importance must be acknowledged by all, wheat being the most important agricultural product, in whatever light we regard it. That the growth and consumption of wheat is yearly increasing there cannot be a moment's doubt, but whether this is owing to improved management or the increased extent of land brought under cultivation is another question. The rotation and systems portrayed by Mr. Ritchie, are, I believe, those that have been and are now pretty generally followed in this district. The subject matter for inquiry is, Can we improve these, or adopt better? On light soils, it is universally acknowledged that seeds (the clovers and ryegrass) or leys, as termed by some, are the best preparation for the wheat crop. Whether these should be ploughed up at one or two years old depends in a great measure on the staple of the soil, as what are termed light lands vary considerably in their texture, according to the amount of clay they contain. My own opinion is, that for the generality of the light soils of this neighbourhood, which are mostly of a dead sandy nature, wheat succeeds better after two years seeds than one, as by being kept down two years they become more completely covered with the artificial grasses, thereby causing a firmer, consequently a more suitable seed-bed. Another method which I have tried to a small extent, and which I approve, is to clean skim-plough as for wheat a portion of the seeds early in the spring of the second year, then work it with drags and harrows, and drill it with rape, with about 3 cwt. of superphosphate per acre. It is an addition of something like £2 per acre to the expense, and it produces very little more feed; it, however, comes in at a time when keep is serviceable, and is of better quality, and I have invariably found a better yield of wheat, and the land cleaner, and in better condition, after the wheat is off; still I should advise its adoption to a limited extent only, say one-sixth. Our friend Mr. R., in his remarks, says we do not see any of the clover roots in two year ley when it is ploughed. Probably not; but I contend there is a much greater amount of fibrous root (not couch) in a two year old ley than in one year old. The latter oftentimes when being ploughed hardly leaves a whole furrow discernable on these lands. I prefer one furrow to more, or to raftering, using the skim coulters, and ploughing to a moderate width and depth. I think eight inches by four inches quite wide and deep enough for most of the soils I am speaking of; in fact, on the farm I occupy, at three and a-half inches the plough would be grubbing the rock most of its course. By this system over raftering we get three weeks' or a month's keep, and if well done the land will be cleaner after the one plough and in a better state to receive the seed, and at a much less expense. I quite agree with Mr. Ritchie that light soils should be ploughed some time before planting, and that they should receive a sufficient amount of dragging and harrowing to well break the furrows on the surface. If at all hollow, Cambridge's or Crosskill's roll should be freely used, consolidation being, I may say, absolutely necessary to insure a crop on these soils. This reminds me of a system practised to a considerable extent in the counties of Berks, Wilts, and Hants, that of a wheel-presser following the plough, completely

pressing in and burying any bits of grass left on the edge of the furrow, and leaving a sort of groove, which, when the wheat is sown broadcast (as is generally the case), becomes a receptacle for the seed, and it comes up in rows almost as true as if drilled, with the exception of (what I consider to be an advantage) the plants not too crowded together. This system I have every reason to believe would answer well on our hills. Next comes the time of planting, and this I think should take place between the third week in September and the third in October for full wheat. As regards our April or spring wheat, I consider it requires much the same treatment as barley, and may be planted successfully from the third week in March till the first in May. The last week in March and the first in April I think the best time. Now comes the mode of planting; and here I decidedly say by the drill, which raises the question as to the width between the rows. I say this should be from seven to eight inches. I will relate to you a little experiment that I tried in the year 1852. I divided a field of eight acres of two years' seeds into four portions of two acres each, two of which were drilled at a width of rather over $7\frac{1}{2}$ inches, with 14 gallons or 7 pecks of seed per acre: two at $8\frac{1}{2}$ inches, with 12 gallons 1 quart; two at nearly $9\frac{1}{2}$ inches, with 10 gallons 2 quarts, and the remaining two at 11 inches, with 8 gallons 3 quarts. The land was ploughed in August, rolled, well dragged, and planted the last week in September. The whole came up well, the thin lots through the winter, in proportion to the width and quantity of seed, looking the most barren. The plant, however, stood well through the winter, and as spring advanced the thinner portions began to assume a more healthy and vigorous appearance—in fact, it soon surpassed in luxuriance the whole of the wheat on the farm. As harvest time drew on, it became very evident that the straw of that at wider intervals was not so kind and healthy, being more flaggy and darker in appearance, and there was a decided difference as to the stages of ripeness. That drilled $7\frac{1}{2}$ with the seven pecks of seed, being quite a week earlier than the widest and least quantity of seed; the intermediate lots in corresponding ratio. Now as to the results with respect to the straw: the difference in weight to appearance (I did not weigh it) was much the same, that from the thickest portion being much the kindest. Lot 1st, from the 14 gallons of seed, gave 27 bushels 3 pecks of head wheat, weighing $62\frac{1}{2}$ lbs. per bushel, with 67 lbs. of tail; lot 2, from the 12 gallons 12th, 28 bushels and half a peck of head, weighing 61 lbs., with 77 lbs. of tail; lot 3, from 10 gallons 2 quarts, gave 26 bushels 1 peck, weighing a trifle over 60 lbs. per bushel, with 84 lbs. of tail; lot 4, from 8 gallons 3 quarts, yielded 25 bushels $3\frac{1}{2}$ pecks, not quite 60 lbs. per bushel, with 101 lbs. of tail. The whole was harvested well, but there was a decided difference in appearance in the value of the several lots. I was, however, much struck with the similarity of the yield. The conclusion I arrived at was that, as a rule, the narrowest intervals with the 7 pecks of seed were the safest to follow. Mr. Drew also made some practical remarks on the subject of manures, but want of space compels us to abridge our report.

Mr. G. THOMAS thought with Mr. Ritchie that seeds (or ley) were a good preceding crop for wheat, but differed from him with respect to mowing them twice. He thought the more they were fed the better.

The CHAIRMAN wished to know the advantage of keeping down seeds two years. If shortness of pasture land and maintenance of stock were the object, he thought it would be better to lay down a portion permanently, as he should think by keeping it two years in grass it would be more apt to get foul, thus endangering the prospect of a crop of wheat. With

respect to drilling the seed, he thought the intervals between the rows should be wide enough to admit of horse-hoeing, and 6 pecks he considered a sufficient quantity of seed; it should, however, be of the best description, not only as regards the kind suited to the soil, but also truthfulness of character and fullness of berry. Frequent change of seed was also a great requisite.

The following resolution was ultimately adopted:

"That as a general practice, manures should be applied to the lands for the root crops, clover, or beans, instead of directly to the wheat crop. That in case of a deficiency of plant, Mr. Drew's experiment is strongly in favour of the spring application of nitrate of soda. That after roots are hauled off the land (supposing the land to be deeply ploughed for the roots) the less working the land has the better for the wheat crop. That after roots fed on the land a ploughing of about 3 inches is the best. That on large light-land arable farms, the five-course system is preferable to the four-course, as the land is much better consolidated and prepared for wheat by feeding second year. That the two years' ley should be ploughed up about August, and should be afterwards firmly pressed, and as soon as any couch that is in the land shows itself, it should be forked out, or worked out by the cultivator. That in pastoral districts the four-course system is preferable, the clover being mown twice. That the best time for reaping wheat is as soon as the straw is turned yellow at the ground. That two bushels of seed, which should be of the best quality, should be sown on the hills, but that a smaller quantity is sufficient on richer soils."

DERWENT ANNUAL PLOUGHING MATCHES.

The annual prize ploughing matches in the Derwent Vale district were held in a field on Stephen's-hall Farm, the property of Mr. W. Cowen, between Ryton and Greenside, North Durham, on Wednesday, Feb. 7. The managers acted very judiciously in dividing the classes, the first being for men competing with wheel and swing ploughs, the second for boys under eighteen years of age with the same. There were ten entries of men for the wheel-plough, and fifteen for the swing-plough; two boys for the wheel plough, and five for the swing plough, the whole number being thirty-two. The appearance of one field was animated in the extreme. It was about twenty-five acres in extent. The soil was in capital order, and turned up beautifully. The well-laid furrows were such as in almost every case won the admiration of the spectators, a vast number of whom were in attendance, for the most part farmers. The judges were Mr. Henry Brownless, Hill House, Brancepeth; Mr. George Arthur, Hill Head, Mewburn; and Mr. Joseph Robinson, Greenwell House, Blaydon Burn. They frankly expressed their high opinion of the work performed by the competitors generally, and especially of the following, to whom, as will be seen, prizes were awarded.

Class I.—Men.

Wheel-ploughs—1st prize, Thomas Pearson, Low Moor, Durham. 2nd, £1, Thomas Jamieson, with Mr. Yellowby, East Boldon.

Swing-ploughs—1st prize, £3, Andrew Kerr, with Mr. James, Reedchester. 2nd, £1, George Wilkie, with Mr. Fish, East Boldon.

Class II.—Boys under 18 years of age.

Wheelploughs—1st prize, £1 10s., George Bruce, Hodgepudding, Denton. 2nd, 10s., J. Corner, with Mr. Richardson, Hollinside.

Swing Ploughs—1st prize, £1 10s., Robert Wood, Heavy Gate. 2nd, 10s., James Heslop, with Mrs. Turnbull, Fenwick, Stamfordham. Highly Commended, G. Hunter, Medomsley.

The annual dinner was held at the Rose and Crown, Greenside, and a "merrie" meeting was spent.

PLOUGHS AND PLOUGHING.

BY AN AMERICAN.

We resume our notice of Mr. French's views on "plowing." The next point which our Transatlantic friend proceeds to consider, is "the influence of velocity on the draft."

"We are accustomed (he observes) to associate the idea of increased speed with that of greatly increased power. With regard to ships, canal-boats, and the like, it is considered a general rule, that in doubling the velocity of a body moving through a fluid, that body not only impinges on twice as many particles of the fluid, but on each of them with twice its former force, so that the resistance increases as the squares of the velocity. The velocity of locomotives on railways is limited by various circumstances, so that it is well understood that a low rate of speed is far more economical than a higher rate. But the resistance opposed to the plough in its work is mainly attributable to one principle—that of friction; and it is a well established proposition that friction is not in general increased by an increase of velocity. In accordance with this principle, the results of careful experiments with the dynamometer, with the same teams and ploughs, at various rates of speed, indicate no difference whatever in the draught of the plough, when at work at the speed of $1\frac{1}{2}$ miles and $3\frac{1}{2}$ miles per hour. It was found, however, that although the average draught was substantially the same at any rate of speed between $1\frac{1}{2}$ and 5 miles an hour, yet that the oscillations in draught were greatly increased—that is to say, that the draught at a slow rate was more regular than at a higher rate of speed. This is readily accounted for, because of obstructions in the soil. A stone, for instance, upon which the ploughshare should strike with double the usual velocity, would cause a momentary increase of draught, followed by a decrease as the plough should slip past it.

"The principles thus practically established, that increase of velocity in ploughing involves no increase of draught, is of the highest importance as respects the question whether slow or fast-moving animals should be employed in this work. An ox-team, moving at the rate of $1\frac{1}{2}$ miles per hour, will plough an acre, turning a furrow 9 inches wide, in 7 hours and 20 minutes; while a horse-team, moving at the rate of $2\frac{3}{4}$ miles per hour, will accomplish the work in 4 hours; and the actual power exerted on the plough is the same in both cases. Hence the importance of employing active animals in all labour of this kind for which they are suited. Slow animals like oxen cannot, with or without a load, be driven rapidly; but within the natural walking pace of the animals employed, there seems to be an actual waste of power in proportion to the increase of the time employed upon the ploughs; or, in other words, the same force is exerted every moment of eight hours in ploughing an acre at a given width and depth of furrow, as is exerted in the 4 hours in which a horse-team may perform it at a fast walk.

"There is, however, another element which cannot be estimated by the dynamometer or any other instrument, yet should enter into our consideration of this topic. Every animal in moving, with or without a load, carries the burden of his own body; and it is probably true that this burden is somewhat in proportion to his weight, and to the

speed with which he moves. To illustrate this, we have only to look at the facts developed by the dynamometer in ploughing over hills. It is found that the draught of the plough is very little varied by ploughing up or down a descent; while every farmer knows very well that his team walks much harder in ascending than in descending. So, if a team be driven up a steep hill without a load, the animals obviously exert themselves more than in moving at the same pace on level ground. The greater difficulty of ascending may be partly accounted for upon the common principles of gravitation. In raising himself to the top of a hill, to a position 20 feet higher than he before stood, the animal has exerted as much power, in addition to his effort on the level, as would be mathematically necessary to raise the same dead weight the given height in the same time; and something more may be added for the distorted action of the muscles, and in ploughing for the disturbance of the true line of draught. Even upon level ground, it requires some exertion for any animal to move, and this exertion is probably proportioned in some measure to the rapidity of the motion. Any calculation upon this point, based upon the difficult theories of momentum, would be of no practical value. Assuming, as we may, upon the facts disclosed by the experiments referred to, that the draught of the plough is not substantially increased by the velocity of its movement, it is for the farmer to consider the natural pace of his animals, the saving of time of his labourers, as ploughmen or drivers, by rapid work, the increased danger of injury to team or implements where the work is obstructed by stumps or stones, and he must make the best practical use of the developments of science made for his benefit."

The fifth point considered by Mr. French is, "The influence of wheels of various kinds upon their draught, and their utility;" and upon this head he says:—"The greater part of the ploughs used in England are supported by two wheels, one on each side of the beam, usually arranged so that one wheel runs in the furrow and the other on the unploughed land, there being a difference in their radius of about the depth of the furrow. They are, however, separately adjustable, so as to be changed to gauge furrows of different depth. The theory, as stated by a farmer who was defending the use of the old Norfolk plough, with its high wheels, is plausible enough, in favour of wheels. 'The draught of the plough,' said he, 'results from its friction on the furrow-slice, and on the bottom of the furrow; and whatever weight rests upon the wheels is taken from the sole of the plough, and relieves the draught so much as the difference between rolling and dragging friction.'

"Various trials have from time to time been made in England with a view to determine the influence of wheels upon the draught. Mr. Handley's trials, reported in the Journal of the Royal Agricultural Society, made with four different ploughs, indicated an advantage from the use of wheels of about 15 per cent. Mr. Pusey's experiments made the difference still greater, amounting to 29 per cent, in favour of the wheels. Mr. Morton, in a series of carefully conducted experiments, made with full knowledge of the previous trials by the other gentlemen named, arrives at the conclusion that when a plough is properly set, the

addition or removal of a wheel will make no material difference in the draught. There is a difficulty in determining this point accurately. Mr. Pusey, in his trials, took off the wheels from a wheel-plough, and made the comparison between that plough, thus used as a swing plough, and the same plough used with the two wheels which belonged to it. Now, it is obvious that a plough properly constructed for use with wheels, and, of course, to rest a portion of its weight upon them, might be increased very much in its draught by throwing that weight upon the sole of the plough, or otherwise gauging its furrow by the mode of holding, or of attaching the team to it to prevent its burrowing too deep. On the whole, it is believed that the draught of the plough can be very little affected by the use of wheels. Most American sod-ploughs are used with a single small wheel or truck to gauge the furrows. Sometimes this is directly under the end of the beam, and sometimes by its side; and so far as gauging the furrow is concerned, it is almost indispensable; but it is not apparent why the draught of a plough should be diminished by throwing a weight on the wheels, if the plough could be so constructed as to run at the desired depth uniformly without such wheels. It is manifest that with the wheels, or without, there is the same cutting process to be performed, which, as has been seen, causes more than half the draught; there is the same friction upon the mould-board, which must cause nearly, if not quite the same pressure and friction on the sole; there is the same weight of the implement to be dragged, and certainly it would move more easily on wheels, if the plough were so constructed as to rest part of its weight upon the beam when not at work, which is not ordinarily the case. What gain there can be by so arranging the parts that the draught of the team shall bring a weight down upon the wheels which support the beam is not perceived: but it seems that the force which thus bears down upon the beam were better applied in overcoming the legitimate and unavoidable resistance of the soil to the plough in its proper work. If the wheels are useless, it is sufficient objection to them that they increase the weight and cost of the implement. If they are useful merely as a gauge of the depth of furrow, the single wheel, as being more simply and easily adjusted, and as being a lesser obstacle in handling the plough, especially in short work, seems preferable."

Sixthly, Mr. French proceeds to consider the "Effect of the length of the various parts, as the beam, the mould-board, and the handles, on the operation of the plough."

"The English ploughs (he says) are on an average two-fifths longer than American ploughs. There is an obvious reason why short ploughs must be used on the new lands of our country and in the stony and uneven lands of New England. Where a stump is to be avoided in every 10 feet, or a stone to be scaled at every rod; where the share catches a harder root, and the team is to be backed every five minutes through the day, and the plough dragged backward by main strength; where it is to be set in again as often as it is thus thrown out, with a precision of aim equal to that required in rifle shooting—manifestly nothing but a short, strong, stiff implement can possibly be used. For such land the long English plough has no pretence of fitness; but upon the old fields and bottom lands—upon the prairies after they are once broken, there seems to be no reason why the same ploughs which would really be most suitable on English farms should not here be most serviceable. The additional length of the English plough seems to be pretty equally distributed between the handles, the mould-board, and the beam. Great length of handles gives greater power

in controlling the movement of the plough, and greater length of beam gives greater steadiness to the draught; yet the increased length of both these parts necessarily increases their weight, upon the principle of the lever—the greater the length, the greater the strength to resist the power applied. As to the length of the mould-board, it is frequently contended that the longer the curve which turns the furrow, the less the resistance, the mould-board being regarded as operating as a wedge; but this idea is open to many objections.

"This part of the subject involves, however, so many considerations which belong rather to the plough-maker than the farmer, that it is hardly appropriate for discussion here. Whatever may be the true theory [as to the length of the mould-board, its increased length does not necessarily involve the increase of the length of the other parts.

"To the practical working of the long English ploughs, there is an obvious objection in the minds of all who have seen them at work in small fields. Horses are almost exclusively used there upon the plough, and are harnessed one before the other, and with greater length of draught chains than we are accustomed to use. As a consequence of this long-drawn-out establishment a wide headland is left, utterly beyond the reach of the plough, so that where in America we back up and set in our short plough close to the fence, the English farmer sends a man with a spade to work a half-day in finishing up the land. Where labour is cheap, as in England, this is of much smaller importance than it would be with us.

"As a general summary of the matter as to the comparative merits of the English and American ploughs, it is believed that we have greatly improved upon the models in the lightness of our implement, in the less cost of it, and by dispensing with their more complicated arrangement of wheels. Whether, by shortening the whole implement about two-fifths, we have not sacrificed to our peculiar wants upon new fields something of the nice control which the length of beam and handle gives to the English ploughman, is at least questionable. Whether we have gained or lost by our changes in the length and form of the mould board, is still undetermined, and must remain so till both implements are tested in the same field by the dynamometer. There can be no doubt that generally their ploughmen have more skill in their business than ours in New England; and he must be a careless observer, or blinded by prejudice, who does not see that their labour in this important department is better performed than in our own country."

In referring to Mr. French's views on English ploughing we announced an intention of returning to notice what that gentleman has to say about steam-ploughing on both sides of the Atlantic. Mr. French, after describing the action of Fowler's apparatus, with which our readers are for the most part familiar, says:—"This machine could only be of practical utility on level clear fields of large extent. It could only be used upon level fields of uniform surface, because the ploughs are set in an unyielding frame, and must run at the same level, thus running deeper across a hillock, and more shoal in a small depression. They are arranged not so as to be raised and depressed, each separately, as the machine is moving, but the whole gang is acted upon at once. Again the engine would be of no use in a small enclosure, because of the broad headlands requisite to accommodate the engine on one side, and the anchor on the other. It could be of little use in a field obstructed by stones, because of the inequalities of surface

produced by them, and because if one of the ploughs meets an obstruction too obstinate to yield, the power of the engine must generally be sufficient to break the plough, or what is more common, the rope. The breaking of a plough must involve, at least, the necessity of a delay sufficient to detach it, and substitute another, and such a delay of so large and expensive a force as we shall presently see is employed, must be of considerable importance. The breaking of the rope, which I was informed by the workmen was of frequent occurrence, is soon remedied by splicing it; but is probably a constant source of annoyance. As, however, it is impossible to foresee all obstructions, and the engine must exert great power, it is, perhaps, best to make the rope the weakest part of the machinery, as it is the most easily repaired. The force employed in this operation, as I witnessed it, besides the engine, consisted of five men and a boy, viz., the engineer, who remained behind the engine; a boy to carry coal, one man upon the plough to manage it, another man, who rode part of the time on the plough, and who ran along before it to remove pulleys or rollers, over which the rope traversed, to keep it from friction on the ground; another man to tend the windlass and anchor, and the other to keep the rope in place with a crowbar, that it might wind properly round the drums of the engine. In estimating the value of such an implement as this, there are certain elements always to enter into our calculations. First—the amount of labour performed. A pair of horses and a ploughman would in England, as a regular day's work, plough one acre of such land as that under experiment. They would work six hours without feeding, and in that time complete the day's work. This is the practice, I think, in most parts of England as to working horses. Six ploughmen and twelve horses would for six hours perform the same work as the five men and boy, and the engine and all the machinery. But the engine would not then be fatigued, but might labour on, while the horses must rest. Still taking into account the liability of complicated machinery, and of so great a length of rope to accident, which must cause delay, perhaps the steam-plough could hardly be expected to be actually at work nine hours per day any more than the horses. Secondly—The expense and time employed in moving the engine and plough and anchor to the fields of operation, and placing them in position. I did not see the engine or machinery moved with horses; but this item is worth a place in our estimate, both as to expense and time. Thirdly—The cost of working. This has been already considered; but there is to be added to the cost of the labour already named, the expense of supplying the engine with fuel. Both the coal and water are of heavy freight, and must be conveyed to the engine by horses and men. Their cost at the field must depend so much on the locality, that it is useless to attempt an estimate. Probably an additional pair of horses and a man would be usually employed to supply the meat and drink of the steam-giant. Fourthly—The cost of machinery and of repairs upon it. It was said that this engine and plough could be furnished ready for use at £500 or 2,500 dollars. It would require an engineer to estimate the cost of repairs. Unless the machine could be kept in constant use, the interest on the cost would be a heavy item, and in all cases must be a constant element to be regarded. The engine would be adapted to other farm labour, such as thrashing, grinding, and the like. Such engines are in constant and extensive use for thrashing through England on large farms. The inventor of this steam plough had taken a large contract to

plough for several proprietors—a practice which, perhaps, should be kept in view in this discussion, though the difficulty of moving the engine from farm to farm in this country would be far greater than in England, because our roads are not so well made. Upon the best estimate that I have been able to make, it seems to me that Fowler's steam plough can never be made an instrument of general practical utility, either in this or in any other country. Perhaps a more competent person with such data as has been furnished may form an estimate more favourable. Simplicity is usually economy, in agriculture especially; and there does not seem upon the theory of this machine any such promise of performance as to compensate for the great expenditure in its structure and the numerous obstacles to its practical operation. Since 1857 Fowler's plough has been extensively used in England, and may be said to be fairly introduced there; but it may be inferred from the tone of agricultural writers and speakers, as gathered from newspapers, that it is quite doubtful yet whether it is really a valuable acquisition to agriculture. Subsequent experiments seem to indicate that my own estimate of the performance of the plough was too large. A recent writer in the *Mark Lane Express* states that at one trial which he witnessed the plough turned seven acres in twelve hours; and another account gives ninety-six square rods per hour as the result of its labour. Of Boydell's traction engine, Mr. French, after giving a general description of the arrangements and working, says: "Many of the objections the stationary engine are obviated by this invention. No horses are required to move it from place to place, or draw its supply of food and water. The cumbrous anchor with the long ropes are dispensed with; and if the adjustment of the ploughs, as used by Fowler, is found most convenient, there is nothing to prevent its adoption and the drawing of his ploughs with this locomotive engine." Of course Mr. French cannot dismiss the subject without some observations upon Smith's cultivator, with regard to which he says: "In the progress of all arts and sciences it is observed how principles at one time deemed most vital come afterwards to be regarded as of secondary importance; and, still later, again assert their original claim to attention. Pulverization of the soil was more than a century ago advocated by Jethro Tull as the one essential to good husbandry, and he even regarded manure as valuable only as assisting to pulverize the soil by fermentation. In later years chemistry assumed a conspicuous position in agriculture, and many have been inclined to regard more the constituent elements of plants and of artificial manure than the mechanical condition of the soil; like quack doctors, whose attentions are so much occupied by their specifics that they entirely overlook the condition of their patients. But now, after the practical failure of the theories of some distinguished chemists, agriculturists are again disposed to regard the physical condition of the soil as of primary importance; and the operations of draining, subsoiling, and otherwise opening a greater depth of soil to the action of the atmosphere and to the roots of the plant, engage the attention of the farmer. As land becomes more valuable, it is found more convenient to add another seed-bed to the field, by preparing it under the shallow furrow turned by our fathers, rather than by annexing our neighbours' farm, in the covetous desire to possess all the land that adjoins our own; and so we are looking for more power, to work our land deeper, and to pulverize it more

thoroughly. In England, four or five ploughings are considered an essential preparation for a good crop of turnips. In America, where labour is more costly, and products usually cheaper, we the more need some more aids to our husbandry. Twig says that Romulus, in his distribution of the land, allotted two acres to each citizen; and that, after the expulsion of the kings, it was increased to seven. Columella tells us that the patrimonial estate on which Cincinnatus employed himself, consisted of four acres! Yet we, whose single farms are larger than the city of Rome, with her seven hills, are plodding along, bound to the old notion that the plough used by the Romans—or, at least, its principles of operation—must be for ever preserved.

"Every one knows how much better is the preservation of the garden by forking up and raking, than by turning with ploughs, and harrowing; and the implement desired now, in place of the plough, is a forking or digging machine that shall, at one operation, stir the ground to sufficient depth, leaving it as nearly as possible in the condition of a garden-bed prepared with a fork.

"Such a machine has been attempted by Smith of Woolston. The idea which has thus been advocated by Mr. Smith, seems at about the same time to have possessed some ingenious agriculturist on the other side of the Channel. In a walk near Paris, in July, 1857, I accidentally came upon a steam cultivator, or digging machine, in full operation. It was a locomotive engine, with (I

think) twelve spades, or forks, working in pairs, on bent axes, from which the spades, if they may be so called, projected at right angles. My impression is, that each pair of spades struck the ground and entered it separately, each of the six pairs successively doing its work as the locomotive traversed the ground, and thus forking up the soil to the depth of six or twelve inches, at the will of the operator, and four-and-a-half feet wide. The machine was under examination by some commission at the time; and I was informed that no report had yet been made upon it, no patent secured, and that no description or drawing of it could be obtained. I took a great deal of pains afterwards to obtain information, and, from my inability to do so, inferred that there were reasons why the inventor desired at present that his machine should not be made public. I was told, upon the ground, that the engine, was only of three-horse power; but its performance indicated far more. It moved upon broad wheels over the soft ground, which had been before stirred by it and turned without difficulty at the end of the furrow. The spades, I think, were upon three or four independent axes, and worked between the wheels of the engine. With my inability to converse on a technical subject in the French language, I could not understand its details, and find it impossible to convey more than a general impression of the working of the machine."

Some details with regard to American steam cultivators remain yet to be given.

THE ROT IN SHEEP.

[From the article on "Sheep," by the late John Ellman, Esq., in *Baxter's Library of Agricultural Knowledge*.]

A great difference of opinion prevails respecting the nature of this disease, but I am inclined to believe it is produced by the sheep feeding on wet pastures during the months of June, July, August, September, and October; when if one night's hard frost occurs, unaccompanied with snow, it destroys whatever causes the disease. The ravages made among sheep during the last two or three years, ought to be a sufficient inducement for every flock-master to endeavour to discover the cause of this disease.

It is more easy to prevent than to cure, and with respect to the rot, I believe there is no remedy: it may, however, be arrested in its progress for a short period, but it must ultimately destroy the animal.

The supposition that a ewe will not take the rot while suckling her lamb, is altogether erroneous; and I believe that any ewe suckling her offspring during the months before-mentioned, and put upon land calculated to cause rot in other sound sheep, will become rot also.

As wetness of land causes the rot, I strongly recommend all breeders who have wet lands to have them thoroughly drained, which will materially act as a preventive. Some have contended that salt will cure the disease; this I do not believe, but I think it will act as a preventive, and have therefore given it to my sheep in troughs. I know some farmers who have used rock salt, which has been placed in the field, where the sheep are feeding, between three sticks fixed firmly in the ground, at the height of from eighteen inches to two feet from the surface. This the sheep will be frequently seen to lick.

Sheep, when kept on turnips, should have hay, and pea or

bean straw, well harvested, to counteract the excessive moisture of the turnips.

About forty or fifty years back, Mr. Fleet, from the neighbourhood of Farnham, advertised a discovery he had made to cure rotten sheep. I informed him that I intended to make a trial, and requested him to meet me at my farm at Glynde. The season was wet, and numbers died. I therefore had no difficulty in collecting one hundred sheep from my neighbours in a very diseased state, having none myself but what were perfectly sound. Many of these were in a most wretched state, and three or four died before any medicine could be given. A drink was given to the remainder in the morning by the directions of Mr. Feet, which consisted chiefly of turpentine; some died that day and in the night following. The next morning another dose was given of about a large wine-glass full, and the dose repeated on the third morning; several, however, died after the second dose. I examined those that died, and I believe that many of the flukes were dislodged from the liver and driven to the intestines, and some were even voided. After the third dose several more died, but upon examination most of the flukes were dislodged from the surface of the liver, and completely driven from the ducts, but they evidently were either too large to get through the gall-duct, or else the medicine did not reach them; after three days more, I returned all that were alive (about seventy in number) to the different owners, with a request that they would not keep them as store stock, but fatten them, and report to me the state of the livers when slaughtered, which they accordingly did. The livers were found to be very pale, but perfectly free from flukes, and the sheep fattened very well.

ON THE ACTION OF SALTPETRE EMPLOYED AS A MANURE.

[TRANSLATED FROM THE FRENCH OF THE "JOURNAL D'AGRICULTURE PRATIQUE."]

In a series of investigations, the results of which I have presented to the Academy, I have shown what is the influence of nitrates associated with phosphates upon the development of vegetable organization, and, consequently, upon the assimilation of carbon by the leaves. In every case, helianthus, on reaching efflorescence, have weighed just so much more in proportion as the saltpetre put into the soil has been stronger.

The precision with which I have been enabled to dose the nitric acid, by means of the tincture of indigo, decided me to extend my observations, in order to determine more strictly than I had done, the nitrate absorbed by the plant, and that retained by the soil, whether naturally or modified.

The helianthus were cultivated in a white quartzose sand with small round grains, with which, in order to favour the access of air, we had besides mixed large fragments of quartz. The soil, and the earthen pot which contained it, were washed with abundance of water, to remove entirely the saline substances, and then calcined to a red heat.

The grains gathered and analyzed in 1857 contained 2.87 per cent. of azote. First experiment, helianthus under the influence of gr. 0.083 of nitrate of potash. The soil was formed of—

	Grammes.
Quartzose sand	400.00
Fragments of quartz	100.00
Phosphate of lime	1.00
Nitrate	0.08
The pot weighed	214.00
Total	715.08

The vegetation was conducted in the open air, but sheltered from the rain. The soil was watered with distilled water, exempt from ammonia, and containing about one-third of its volume of carbonic acid gas.

On the 22nd of June we planted two grains, weighing together gr. 0.116, before containing 0.0033 of azote.

On the 15th July the helianthus had each four leaves formed and two buds. The cotyledons were withered.

The 10th of August: The plants have followed the ordinary development; the oldest leaves have faded as the new ones appeared. We have never counted more than four leaves intact.

The 20th of September: The two helianthus bear twenty-three leaves: those at the base of the plants are faded. Each plant has a flower, of a fine yellow, the corolla of which does not exceed a centimetre in diameter. The thickness of the stalks is three millimetres; the heights twenty-six and thirty-three centimetres.

The roots were perfectly healthy, and were easily taken up. The plants dried in a stove weighed gr. 1.168. Analyzed by a single operation, they yielded gr. 0.0102 of azote.

DOSE OF NITRATE REMAINING IN THE SOIL.

The water in which the sand and the pot reduced to powder were put in digestion remained colourless. In this water we put a dose of 0.0107 of nitric acid, equivalent in azote to 0.0028.

THE EXPERIMENT CONTINUED.

	Gr.	Gr.
In the grains, azote	0.0033	
In 0.08 of nitrate	0.0111	
Azote introduced	0.0144	0.0144
In the plants, azote	0.0102	
In the soil in the state of nitrate	0.0028	
Azote found	0.0130	0.0130
Difference		0.0014

NITRATE ABSORBED BY THE PLANTS, AND NITRATE REMAINING IN THE SOIL.

The 0.0107 of nitric acid found in the soil represents

Nitrate of potash	0.0204
Nitrate of potash introduced	0.0800

Difference	0.0596
Of which the equivalent in azote is	0.0083

If the nitrate expressed by the difference 0.0596 had been absorbed, the helianthus would have fixed the 0.0083 of azote belonging to that salt; but this has not been the case. In fact,

	Gr.
The plants contained azote	0.0102
Deducting the azote of the grains	0.0033
There remains	0.0069

for the azote acquired by the helianthus attributable to the nitrate absorbed, and not 0.0083.

The soil, therefore, ought to have had in it the nitrate not assimilated by the plants, but which was not found in it. It is very probably the nitrate transformed into carbonate of potash, the azote of which has not been fixed definitively by the plants. We have stated plainly that the water in which the soil was put in digestion was merely alkaline.

DOSAGE OF POTASH IN THE SOIL.

We have found in the water into which the soil and the pulverized flower-pot were put in digestion, 0.007 of potash, which could have no other origin than the nitrate of potash, because of the washing to which all the earthy matters were subjected. 0.007 of alkali would take 0.0080 of nitric acid to constitute 0.0150 of nitrate, which belonging to the soil, ought to be added to the salt directly dosed.

NITRATE OF POTASH ABSORBED BY THE PLANTS.

	Gr.
Nitrate corresponding with the potash found } in the soil	0.0150
Nitrate found in the soil	0.0200
The nitrate of potash non-absorbed	0.0350
Nitrate introduced into the soil	0.0800
Nitrate absorbed by the plants	0.0450
The equivalent of which in azote is	0.0062
The azote fixed by the helianthus attributable } to the nitrate being	0.0069

It will be seen that these two numbers differ only to the extent of 7-10ths of milligramme.

ASSIMILATION OF CARBON BY THE HELIANTHUS S.

In deducting the weight of the seeds, 0.116, from the weight of the dry plants, 1.168, we have 1.052 for the organic matter developed in 89 days of a vegetation accomplished under the influence of 0.045 of nitrate of potash absorbed by the helianthus, and including 0.0062 of azote assimilated.

By admitting, according to previous analyses, into the organic matter 0.40 of carbon, the plants would have fixed 0.420 of it, proceeding from 1.544 of carbonic acid, say 780 cubic centimetres of 0 deg., and under the barometrical pressure of m. 0.76.

By day, and at a medium, the helianthus have therefore assimilated the carbon of ce. 8.75 of carbonic acid gas.

2nd Experiment: Helianthus brought under the influence of 0.16 of nitrate of potash. The soil was formed of

	Grammes.
Quartzose sand	400 00
Fragments of quartz	100 00
Phosphate of lime	1 0 0
Nitrate	0 16
The flower-pot weighed	216 0 0

717 16

The soil was steeped and washed with the distilled water exempt from ammonia, and containing about one-third of its volume of carbonic acid gas. The vegetation took place in the open air sheltered from the rain.

On the 22nd June we planted two seeds weighing together 0.116 grains, which should enclose 0.0033 of azote. On the 15th July, we counted four leaves developed, and two budding on each plant. The cotyledons remained green till the 19th of July.

The 10th August there were many leaves, the oldest of which were faded.

The 20th September, each of the helianthus bore a fine flower of a deep yellow, having a corolla of 0.02 m. in diameter. Of fourteen leaves on the plants, eight were faded. The largest of the leaves were 0.04 m. in height by 0.02 m. in width. The height of the stalks were 0.25 m. and 0.43.

The roots were perfectly healthy, and were easily disengaged from the sand. Dried in the stove, the plants weighed 2.120 grammes. By analysis at one operation they gave 0.0148 gr. of azote.

THE DOSAGE OF NITRATE OF POTASH REMAINING IN THE SOIL.

In the water in which the seed and the flower-pot pulverized were put in digestion, we dosed with 0.03725 grammes of nitric acid, the equivalent of 0.0697 grammes of nitrate, enclosing of azote 0.0097 grammes.

SUMMARY OF EXPERIMENTS.

	Grammes.
In the seeds, azote	0 0033
In 0.16 grams. of nitrate, azote	0 0222
Azote introduced	0 0255
In the plants, azote	0 0148
In the soil in the state of nitrate	0 0097
Azote found	0 0245
Difference	0 0010

NITRATE ABSORBED BY THE PLANTS AND NITRATE REMAINING IN THE SOIL.

	Grammes.
The nitrate of potash found in the soil was	0 0697
The nitrate of potash introduced	0 1600
Difference	0 0903
Of which the equivalent in azote is	0 0125

If the nitrate expressed by this difference had been absorbed, the helianthus would have fixed 0.0125 grains of azote; but there was not quite so much of it, for

	Grammes.
The plants contained of azote	0 0148
Deducting the azote of the seeds	0 0033

There will remain 0 0115

for azote acquired, which was attributable to the nitrate absorbed.

As in the first experiment, there was one portion of the nitrate which had not penetrated into the plants, and which at the same time was not found in the soil. It is this part of the nitrate which was transformed into carbonate of potash. The water in which the soil and the flower-pot had been placed to digest was very slightly alkaline after concentration.

DOSAGE OF POTASH IN THE SOIL.

In the water put in digestion over the soil we found 0.0043 gr. of potash, taking 0.0015 gr. of acid to constitute 0.0028 gr. of nitrate. This salt belonging to the soil, ought necessarily to be united to the nitrate with which we dosed the acid.

NITRATE OF POTASH ABSORBED BY THE PLANTS.

	Gr.
Nitrate corresponding with the potash found in the soil	0 0028
Nitrate dosed in the soil	0 0697
Nitrate not absorbed	0 0725
Nitrate introduced into the soil	0 1600
Nitrate of potash absorbed in the helianthus	0 0875
Of which the equivalent in azote is	0 0125

The azote fixed by the plants attributable to the nitrate being 0.0115 gr., the two numbers differ only 6-10ths of a milligramme. In the two experiments, we found in the plants and in the soil almost the whole of the azote that we had introduced by the seeds and by the nitrate of potash given as manure.

ASSIMILATION OF CARBON BY THE HELIANTHUSES.

In eighty-nine days of vegetation, the vegetable matter formed under the influence of 0.087 gr. of nitrate of potash absorbed, weighed 2.104 gr., in which there entered 0.848 gr. of carbon, derived from 3.109 gr. of carbonic acid—say, in volume 1,566 centimetres of 0 degree, and under the barometrical pressure of 0.76 m. Consequently, each day on an average, the helianthus assimilated the carbon of c. 17.6 of carbonic acid gas.

In the following table are summaries of the results obtained in the two experiments, showing that in that circumstance the assimilation of the carbon has been within a trifle in proportion with the azote of the nitrate which has really intervened in the vegetation.

	Nitrate introduced into the soil.	Nitrate introduced by the plants.	Azote contained in the nitrate absorbed.
1st Experiment	0.08 gr.	0.045 gr.	0.0062 gr.
2nd Experiment	0.16 gr.	0.087 gr.	0.0121 gr.
	Carbonic acid decomposed per day.	Weight of plants dried, the weight of seeds being 1.	
1st Experiment	8.7	10.1 cubic centimetres.	
2nd Experiment	17.6	18.3 ditto.	

These researches appear to me to have shown beyond a doubt, that in the modification sometimes sustained in the soil by the nitrate, its transformation into carbonate of potash is due to a purely accidental cause—a reductive action exercised by the dead vegetable matter.

Thus, in the second experiment this modification has manifested itself on 0.001 gr. of nitric acid only; and it would very likely have passed unperceived, if I had not conducted it by a process of analysis so certain and, I do not fear to add, with an execution so easy.

It is to the excellent state of the roots of the plants during the eighty-nine days of vegetation that we must attribute this result. I have already said that the water employed in lixiviation of the soil remained limpid; by

the evaporation it was not coloured, nor had taken that tawny colour which always determines the presence of brown acids; and the nitrate of potash remaining in it, and which we have collected in order to control the analyses, was in colourless crystals perfectly characterized.

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NOTES ON MEADOWS AND PASTURES.

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It now remains to describe two classes of weeds in pastures which, though not presenting long lists, are yet very serious in their consequences. These are—

Firstly: Weeds possessing poisonous properties.

Secondly: Weeds which cause disagreeable flavours to the products of the dairy.

Of the first of these there is reason to believe that many plants which are in themselves comparatively harmless, yet, by reason of *constantly* forming part of the food of cattle, in the end create serious disturbances in the animal economy. We have known meadows which would cause *scouring* in a short space of time, whilst there are others which, by the general stimulating and astringent nature of the herbage, will at once cure such malady. These, indeed, are matters which do not at all times depend upon the species of plants of which the herbage may be composed, but more frequently upon the condition of the soil in which these grow. A damp, ill-drained meadow is often pregnant with mischief, though utterly devoid of a really poisonous plant; whilst a dry upland, in which anything other than grasses may be present, will often be much better adapted to the well-being of stock.

Still, there is one plant, which is very prevalent in some parts of England, which is often the cause of such serious consequences that we shall not do wrong to describe it with the greatest care and attention. This plant is the *Colchicum autumnale* (meadow saffron), sometimes called the autumn *crocus*—an error that should be corrected at the outset, inasmuch as the colchicum possesses six stamens and three pistils, and belongs to the natural order *Melanthaceæ*; while the saffron *crocus*, though otherwise the same in the general form and colour of its flowers, has three stamens and one pistil, and is classed with the *Irideæ*.

The colchicum, in all its stages of development, and in every part of the plant, contains an active principle of very poisonous qualities, which has been named by the chemist *veratrin*. The presence of this renders it a very active medicine, and pharmaceutical preparations are made from the *corms*, commonly called the roots, and from the seeds; but the flowers are, probably, still more replete with the active principle, and consequently more poisonous than any other part of the plant. These

medicinal qualities have for ages recommended colchicum as a remedy for gout; but it is so powerful a medicine, and withal so uncertain in its effects, that these require the sedulous watching of a medical practitioner—facts that are mentioned only to show the powerful effects of colchicum upon the human system.

The colchicum is an inhabitant of moist meadows, particularly in calcareous districts. It sends up simply flowers in the autumn, which are not succeeded by leaves until the following spring; it is then at these two different seasons that its effects are to be dreaded.

In the autumn we constantly hear of cases of poisoning by the colchicum, of which the following may serve as an example. In 1844 we find the following statement in a Cheltenham paper for September:—

“It is only a few days since a farmer at Eyeford, near Stow-on-the-Wold (Gloucestershire), had *ten calves killed by eating of the flowers of the colchicum*, and two or three years since three cows were destroyed by this plant in flower in the same neighbourhood; whilst we frequently hear of many accidents to cattle in the spring from eating the leaves, although it is sometimes refused by them on account of its bitter and nauseous taste: yet there is no doubt but that accidents would be still more frequent, were it not that farmers keep their cattle from the meadows in which it occurs in any quantity during the autumn and spring months.”

This then may serve as an example of the effects of colchicum, which indeed may almost be kept up as a permanent form by the press, to be reproduced from year to year. In the spring these effects are either not so marked, or, as we suspect, the leaves, which are large and bitter, are less seldom partaken of by cattle; still, if the foliage and seeds get into the rick in any quantity, much danger may result without its cause being even suspected. From what we know then of this plant, we should consider it unsafe to depasture it when in flower; and as its large leaves take up a great deal of room which would be much better occupied even if this weed were innocuous, there is every reason to aim at its destruction, which we have found easily brought about by the following processes. When the colchicum is in full bloom, let the meadow be well rolled along and across by a Crosskill: this so scotches

the flowers, that seeding is rendered very difficult. Repeat this operation in spring as soon as the broad blades appear above the ground; this will scotch the leaves—the very lungs of the plant; and if this be followed by pasturage with horses, folded sheep, or any animals which will rather tread it than eat it, it will not many years survive the treatment, for this plan will prevent new plants from seed, whilst the old ones will fast die out from such rough usage.

We now come to an examination of an affection to which grass itself is liable, which there is reason to believe is often productive of serious results to cattle, namely, that condition of the grain which is called *Ergot*. Ergot of rye is the name given to a peculiar spurred condition of the seed of the cereal rye, in which the seed becomes changed into a long, more or less, black or purple spur, of a tough horny consistence; these spurs are collected in quantity in rye-growing countries, for the purpose of medical use, being considered an active drug, which is much relied on by the obstetric practitioner for its effects in hastening the climax in cases of difficult parturition: it is also nefariously employed to procure abortion—facts which speak loudly for its potency; but from the description given by medical writers of its effects in the small but continued repetition of it, in the small quantities in which it would be taken where bread is made from the affected corn, we are led to believe that its operation is perfectly appalling, producing what has been described as dry gangrene, and so killing off whole districts by the most lingering tortures.

These remarks, then, are sufficient to show that ergot of rye (the *Secale cornutum* of the chemists) has very decided medicinal action, and it now remains to show that grass herbage in general is affected with the same fungoid growth. Now, any one who will take the trouble to examine the bunches of flowers of different grasses, as the dews of autumn begin to gather round them, and wet them with hygrometric moisture, especially in the months of September, October, and November, will observe that almost every species will have its seeds more or less ergotized: the perennial rye-grass is particularly liable to this change, and we have noticed it in nearly all our commoner species, the spur varying in size according to the size of the seed of the grass attacked, and there is then no difference, as far as we can observe, between the ergot in rye and that of other grasses, only that the former has a larger spur, because as a cereal grass its seed is so much greater than that of the meadow grasses.

Now, where meadow grasses are affected by ergot there is reason to apprehend poisonous effects to the cattle that depasture it. This is an opinion held by that accomplished mycologist the Rev. J. M. Berkeley; and others, who have studied this matter; and we may here mention that some few years since the Earl Ducie

suffered great loss from the abortion of several of his valuable Shorthorned cows—a loss, indeed, which he estimated at as much as £1,000 for one year: at that time a quantity of grasses collected from the pastures, mostly perennial rye, were submitted to our inspection in order to ascertain if there was anything about them likely to contribute to the result mentioned, and as they were much affected with ergot, we had even at that time not much doubt but that they really were the cause of the mischief complained of; and as this view is now pretty general with those who have thought of the matter, it is desirable that pastures liable to this affection should be watched, and either that the bents should be skimmed off and removed, at least before delicate cattle are turned into them, or that they should for a time be avoided altogether.

The plants which give flavour to dairy products will be understood from the following names:

Allium vineale—Crow garlic.

„ *ursinum*—Hogs garlic.

Erysimum allearia—Jack-by-the-hedge, or sauce-alone.

These all possess an onion-like flavour. The two first are common in some meadows, and where the butter is sent to market their effects are so disagreeable as to seriously affect the price; in fact, for dairy purposes, a meadow much affected with garlics is, from this circumstance alone, reduced fully one-third in value, as it cannot be used for milking-stock in spring, and if mown the new hay becomes highly flavoured with these weeds, which, however, goes off with age; it is, therefore, worth while to take some pains to compass its destruction, and as it will be almost impossible to get it up unless it be in only a few truly distinct patches, our principle of action must be never to let it perfect its leaves—an end which will be best attained by the process recommended for the eradication of the Colchicum: thickly stock it with horses and bullocks, if only for a portion of the day, and closely fold sheep on any patches of the weed in such a manner and for such periods as will prevent any leaves from recovering their bruises; two or three seasons of such treatment will be usually sufficient for the purpose, and good will accrue to the pastures from the action itself.

The Jack-by-the-hedge, as its name implies, will usually be found around the boundaries of the meadow; and as this is either an annual or biennial plant, it should never be allowed to seed; and hence, then, constant pulling, which would easily be done as a day's work by a boy, will be quite enough for a very large field, a cost which would be amply repaid by giving better herbage a chance to grow, which it cannot where the ground is taken possession by so tall and large-leaved a plant as Jack-by-the-hedge which though sauce-alone, is far from solitary in its habit of growth.

THE PHILOSOPHY OF AGRICULTURAL PROGRESSION.

Progress in physical science consists of a series of discoveries. It has been compared to a chain, every link of which is a discovery; to a stair or ladder, every step of which is a discovery; to a person travelling along a road, every pace, as he advances in his journey, being a discovery: and as agriculture is a branch of physical science, it consequently follows that the progress farmers are making consists of a series of discoveries, every discovery being in itself a tangible reality, and as such acknowledged at the bar of Experience. We admit that every link of a chain, for example, adds to its length, the link itself being the undoubted evidence, or measurement, of this length. So is it with the progress made in farming; for every step farmers take in advance places them on fresh ground.

The pioneering foot of the farmer, in the march of improvement, is thus an interesting subject for practical investigation. Prospectively, all is unknown—a midnight scene, upon which the light of science has not yet dawned. Viewing them collectively, as a body, how cautiously do agriculturists advance! how slow, and yet how manifest, are their onward movements! and how certain is the annual advance they make in every branch of their profession! Individually, no doubt, many appear the reverse of willing travellers on the road, ever and anon sitting down, under the impression that they have got to the end of their journey, and, like the sluggard in the parable, grumbling loudly, when called upon by their more restless, go-ahead neighbours to rise and move on, for “a little more slumber to the eyelids.” Indeed, strictly speaking, those who are entitled to the application of pioneers are few in number—a select company, meriting more approbation and encouragement than they generally receive. The great body of farmers are merely followers, never starting until the sun is up, some not until the day is far spent, while too many are only to be heard rattled against opposing obstacles after sunset. Retrospectively, it were difficult to trace the footsteps of either of these groups through the dreary journey of the past.

But, however diversified movements may be when individually considered, yet collectively there is exemplified, in every branch of agriculture at present, a very animated contest—thousands struggling in the race for the common prize. This is seen to most advantage when the different industrial elements, of which the whole is composed, are viewed from neutral ground—such as agricultural societies, landowners, tenants, implement makers, and the various manufacturing interests now actively engaged in the race of agricultural progress.

The grand object is to guide the wheel of progress in as direct or straight a line as possible, in every branch of husbandry, and at as great a velocity as is consistent with the safety of the carriage. The railway train moves along the line with a degree of certainty as to

speed and direction easily accounted for; and although discovery presupposes the existence of fresh ground a-head, yet there is, nevertheless, a wide difference between the wheels of the two carriages under consideration, for the agricultural pioneer has to lay his rails as he advances. When once his line is open, thousands will avail themselves of the privilege of travelling, provided they are conveyed in the right direction.

What then is this right direction upon which locomotion depends? Can any definite rule be laid down for the safe guidance of the pioneering farmer? The mariner, as he navigates the ocean, is guided by chart and compass; or by the latter only, when in unknown or hitherto unexplored seas. Can similar means be placed in the hands of the agriculturist? Or how is he to guide his footsteps when he goes a-head into the regions of the unknown, in search of a more profitable system of husbandry than that which he leaves behind?

Continuing this figure of speech for the sake of the peculiar nature of the illustration it affords, since agricultural progression is a journey whose termination can only be attained when agriculture shall cease to exist, the obvious and only answer that can be given to the above question is this: The right line of direction is that which steers equally clear of both sides. The farmer commenced his journey when time began, and he can only finish it at the end of days. Retrospectively viewed, it cannot be said he has moved onwards at a uniform velocity in a straight line. Through the dark ages of Pagan times, the history of his career is very characteristic of the rising and falling of empires, with the many changes and sad uncertainty experienced during the whole of that period; and since the commencement of the Christian era many obstacles have been thrown before his chariot wheels. In this country he has now, however, had upwards of a century of comparatively unrestrained action, and the result has been a much more rapid rate of travelling than during any previous period; while, prospectively, the future appears full of promises. We repeat, in no previous period of the history of agriculture has improvement been so successfully prosecuted as at present.

We have adopted this mode of illustration purposely to show the propriety of keeping pace with the march of improvement in every branch of husbandry. We have done so because there appears to be abroad, at the present day, what may not inaptly be personified as “OLD EXPERIMENTALITY,” anxiously endeavouring to establish here and there, on this promontory and on that, perfect systems of routine, beyond which progress is, as a matter of course, according to his theory, impossible; for that which is perfect cannot be improved. Instead of steering equally clear of both sides, and moving onwards in the great trunk line of progression, Old Experimentality leads us off at a tangent, or tangential curve, into his own pet promontory, either at the

one side or the other, something in the same way that "ducks are led into a decoy," and then and there tells us, "*Hitherto shalt thou come, but no farther.*" It would be superfluous to waste time in exposing the impropriety of such a fallacious system.

Having thus taken a general view of the march of improvement, let us now turn back and examine the farmer's foot-prints along the line—the series of discoveries that constitute the whole journey, so far as he has made successful progress of late years.

In every branch of husbandry, an experiment which does not prove a discovery, with the prospect of more discoveries to be made in the same direction, is an experiment out of date, and worthless to the present generation. An experiment that proves the attainment of an advance, with the certainty of further advances being made in the same direction, is invaluable. But if it only proves that no farther progress can be made in the direction to which it leads, then it practically demonstrates that the experimentalist is off the main line of progress, and into some of Old Experimentality's grounds; so that he has to return to the main line from whence he started, before he can pursue his journey in the right direction with credit to himself, and as a safe guide for others who are behind following in his footsteps.

The grand practical maxim then is, to note the discoveries individually as they are made, and to set them up as milestones along the line, so as definitely to show the actual rate of progression at which we are moving. For a farmer to stand still, is tantamount to a detached carriage left on the line, to be run into by the first express train—a circumstance always attended with a certain amount of smashing, havoc, and loss to both.

To avoid damage of this kind, the ordinary practice is to "shunt" all useless rolling stock "into sidings" off the line. The traveller as he passes along may see plenty of old-fashioned half-worn out rusty rotting carriages and trucks of this kind at every shunting. They generally speak for themselves, furnishing the best estimate of their own value, which is seldom much. It is otherwise with the advancing train, whose engine gains fresh ground every stroke of its piston.

The rapidity with which discoveries are made, is at times very remarkable. The progress of steam-culture during the last five or six years, or since the Carlisle meeting of the Royal Agricultural Society, is an example of this kind, especially when we compare it with the progress made during the preceding half-century. The reaping-machine furnishes another very interesting example of progress. During the last few years the whole implement trade has been in a kind of revolution. In the manuring of land and feeding of cattle, improvement is equally active and successful. In short, at the present moment there is no department in which rapid progress is not being made.

If the progress thus being made in any of the above branches, such as steam-culture, is examined in detail, one thing manifests itself in a very conspicuous manner, viz., the tendency which every branch has to split, as it were, into sub-branches of a more simple character. With

the subdivision of labour, and the economical advantages arising from it, there are few who are not familiar; and it would appear, from the tendency, that the whole fabric of industry is subject to this common or natural law of subdivision. In other words, discovery has a tendency to subdivide and simplify itself.

To prosecute this subdivision in agriculture is the professional employment of the farmer, the implement-maker, and others practically engaged in the work; while the duty devolving on agricultural societies and the agricultural press is to patronize and encourage the great work of progression by every means in their power.

In the case of steam culture, the first subdivision that demands attention is two motive-powers—steam and horses; so that there is now a race, or competition, between these two rivals as to how much work each is to do upon the farm in the work of cultivation. In other words, we have now in the field steam *versus* horses in the cultivation of land.

As to the result in this great contest, opinions are now being very freely expressed, although very much divided as to the amount of work which each of the two powers will ultimately perform. But the question can never be decided by opinion, this mode of judgment being irrelevant. It is *discovery* that will decide the question; and as no limits can be set to the march of progress, the impropriety of present opinion pronouncing her sentence from the judgment-seat of the future is manifest. Sound experimental philosophy confines the province of judgment to the discoveries already made. And as discoveries are daily being made, it consequently follows that experimental inquiry must daily be made, and the distance made by rivals in the race of progress be measured accordingly.

So far as the two rival powers are concerned, Judgment has not a very difficult task to perform. The facts of the case are so plain and simple as to leave little for anyone to say in the matter. Steam has so many advantages over horses, when viewed in the abstract, as a motor power in the cultivation of land, especially wet clayey land, which sustains an immense amount of harm from the feet of the horses, as to turn the balance in its favour.

Farmers, however, cannot always decide questions purely on abstract principle. On the contrary, they are generally obliged to examine them in a pecuniary light at the same time. Indeed, farming in this country may not inaptly be said to be philosophically as much a commercial enterprise as an agricultural. The former element comprises more of the business of the farm than perhaps is generally imagined; and this is the reason why the prime cost of things, expenses, &c., &c., occupy so prominent a place in all public and private communings in connexion with British husbandry. Were the farmer in possession of both steam and horses the question would be easily decided; but when he has to sell the latter which he himself reared, and buy a steam engine, &c., manufactured by another, commercial questions arise requiring matured consideration before

an exchange is made. It is this which is pressing so heavily upon the introduction of steam culture at present, greatly retarding its progress. In order to do justice to this part of our subject we shall return to it

with greater length, in the hopes of stimulating the Royal Agricultural Society, and other societies of this kind, to encourage progression in steam culture on sound principles.

PRACTICE WITH SCIENCE.

SUNDAY ON THE FARM.

"The sabbath was made for man, and not man for the sabbath."—MARK ii. 27.

Perhaps no class in the community pay more outward attention, or manifest a higher regard for the sabbath than that of farmers generally. Their retired village life, and the manners and customs under which they are brought up, all tend to induce them to respect the day. A man who never goes to church, or it may be to chapel, is now looked upon as almost a heathen, or something analogous to one. It is the regular habit, at all events, to go once to "service." A genuine farmer of the old school would invariably insist upon his family going once to the service, and then conclude that he had done his duty, and no more was to be expected from him: he had been to church, said his prayers, done his duty, and thus thought himself religious. Ah! this form, old-fashioned as it may be, is not religion: it is all commendable in its way, and not to be despised, but real religion influences a man's heart: it is the guide of his life, and the farmer has great responsibility resting upon him in connexion with his servants and labourers: he may influence them greatly for good or for evil by his precepts and example: his is a little world, and he must see to the welfare of it. Much of his influence will depend upon the orderly conduct of the Sunday on the farm. What can be expected of a master who continues to do much business on the sabbath-day? True he cannot work his teams or follow his usual labour, but he can arrange for shifting his stock, for enlarging his sheep-folds, and for reviewing his flocks and crops more intently. Depend upon it this is sabbath-breaking, and if a master will do this, the man will soon take example, and do his own part—it may be at the ale-house, or in a quiet stroll along the hedge preparatory to a revisit in the night, or in noisy boisterous mirth with his fellows on the highways; in fact in any way rather than in attendance at the house of God and joining in his service. It seems most astonishing that, although the great business of life is to prepare for an endless state of being, so few are found to give earnest heed to it: why any one should expect to reach heaven without seeking to obtain it, is more foolish than expecting to reap a crop which was never sown: we don't do this in matters of worldly business. Masters must take heed to make religion a fundamental point, and thus impress with its importance all beneath their care or influence.

I make these few rather unusual remarks, because I am desirous of putting an end to all unnecessary Sunday labour, and thus far to free my brother-farmers from being responsible for the irreligious state and conduct of their dependants. What an amount of Sunday labour may be saved by a strict and careful attention to

making provision for cattle and sheep on the Saturdays! I was deeply grieved on one occasion, when spending a Sunday in the Southern counties, to find that every shepherd was compelled to be in attendance upon his flock the whole of Sunday, and, moreover, that he was expected to remove the hurdles in the folds just as on every other day. I almost thought it a case for magisterial interference. Now, what possible injury would these southern flocks sustain, provided they had a double allowance of food, and a larger plot of turnips set out for them on the Saturday? or what actual loss would the flockmaster sustain, by this setting out? It is not the custom in the North, and no one complains of injury. Why are the poor shepherds of our Southern counties to be debarred the blessings of the day of rest, and the privilege of the Christian Sabbath? Verily these flockmasters have much to answer for in this thing. It is not a work of necessity; it may be a profitable course of management. I am far from precluding any works of necessity or charity, or even withholding reasonable rest or innocent recreation from the labouring classes on the Sabbath. But the great difficulty is in the thing itself; what may be wholly allowable in one case may be a sore temptation in another: to his own master he standeth or falleth. If we are commanded "not to think our own thoughts, nor do our own work," but to give ourselves wholly to God's service on his own day, a man may take that as a rule upon which to act as to what is rest and what is recreation. I don't object to a meditative walk, for the master; a kindly call, or visit to the distressed, for the mistress; a walk, or attractive book, for the children; a run home, for the servant. As to indulgence in idle and frivolous if not sinful amusement, that I utterly repudiate as unworthy of the sacred day. It is abhorrent to God, and in disobedience to his law, which says, "Remember the Sabbath-day to keep it holy. In it thou shalt do no manner of work, thou nor thy servant nor thy cattle," &c. Would that farmers, from one end of the land to the other, would take this subject to heart, and consider in how many ways and in what numerous instances they could, under proper regulations of business, prevent much Sunday labour. Why should the poor little crow-boy be kept from his Sunday-school, if the occasional explosion of a gun would drive away his foes? Why is the dairymaid or the cook kept from divine service, or the shoe-boy or groom? Families should think of these little things—apparently little, but most important to the subjects of deprivation. The soul of the crow-boy is of infinite value. The fact is, the Sunday is too much a day of feasting and pleasure, and all dependants must be made

to contribute to make it so. I have oft pictured to myself the manner in which most plain practical farmers might spend their Sundays. I once visited one of this class, and stayed over the Sunday. We were all up betime in the morning, having some miles to travel to church. After an excellent and substantial breakfast, the servants were summoned into the breakfast-room, and, with Testaments in hand, each readily took his accustomed place. The Scriptures were read as in class, and the master concluded with reading an appropriate prayer. This was an excellent preparation for the religious observances of the day. We attended both the morning and afternoon services, which were conducted by the same clergyman (a true man—no Puseyite), but in different churches. In the evening all the household were again summoned, and a continuous reading of the Scriptures again took place, extending over several chapters, followed by family prayer, in which we took the responses. This I have never forgotten, and though it occurred more than thirty years ago, I always recu to the scene with lively interest. Here was occupation in which all took a part, and that with pleasure. One portion of the evening's engagement I had almost forgotten. The two intelligent servant-lads gave us a very good digest of the sermons of the day, which they had written out, upon which we also made our own remarks. I don't name this as a pattern family, but as one specimen to show how the farmer's family may be profitably and agreeably occupied during the whole of the Sunday.

If I might venture to point out my idea of what a farmer's Sunday should be, it would be something like the following. It should begin on the Saturday by making every provision for it. The straw and provender for the cattle and horses in the fold-yards should all be got in, and be deposited conveniently for serving out in the morning. The turnips and chaff all cut and ready. The meal for the pigs all mixed, and their styres made all clean and comfortable. The sheep in the field should have a double fold, and their turnips should be all cut and placed close beside the troughs in readiness for filling. The household work should be all finished up for the week, and everything be made tidy and clean. The shoe-boy's knives and forks, his boots and shoes, to be all shining and in their places; his yards swept and in order. The other servants should contrive their work in their departments to make all look clean and nice, so that all and everything may contribute to make a quiet and peaceful Sabbath. This is a day of rest; therefore the servants should have the indulgence of an extra hour's repose, which is generally much needed after the toils of the busy week; and when they rise, it is to see a smiling morn free from care and labour. The necessary business of attending to the stock, &c., should be done as quickly and noiselessly as possible; thus making a marked difference in this respect, so that all shall know it as a day set apart for better purposes. The family assemble for breakfast; the master reverently

asking the Divine blessing upon the ample provision, let this meal be partaken with cheerfulness, and sober serious conversation. Immediately afterwards all the available servants ought to be summoned to hear a portion of scripture read, and to engage in family prayer. Then comes the preparation for attendance upon Divine service, to which all that can possibly be spared should have the privilege, and be induced to go—the farmer's own family along with him; the servants, to those places of worship to which they belong or shall prefer; for no farmer ought to influence or coerce in this respect; his duty is to ascertain that they do attend at some place where divine service is properly conducted, but no further. Far better for ordinary minds to attend upon a plain Methodist preacher than to hear the sophistries of the new Popish Puseyite preachers. The one may pervert gospel truth through ignorance: the other does it intentionally and systematically as of right divine, and by virtue of apostolic usurpation. The family return with cheerful thankful hearts to partake of the Sunday dinner, all gratified, and impressed with a sense of duty done, and through the Divine blessing of good received. The sermon is reviewed, and its precepts further impressed upon each mind. The recognition of friends, and the delight and pleasure of the weekly gathering, are discussed; and thus the time passes profitably, and each feels better and holier for the morning's occupation, and in gratitude their hearts are lifted up to that God from whom all their blessings flow.

The Sunday Dinner.—This being a day of rest from worldly toil, as well as for religious observance, and being the only day in the week upon which a farmer's family can comfortably congregate, I think the dinner should be one of somewhat extra character, but easily cooked, and capable of being served without effort. I do not like cold comfortless dinners for the Sunday: I would have everything done that can conduce to make it the best day in the week, all being in subserviency to its divine appointment as set apart for God's service.

In the afternoon, or evening, as the case may be, again to service, when such members of the family as by domestic and other circumstances were prevented attendance in the morning should now take their privileged turn. The evenings, where there is no evening service, to be spent in religious reading or religious conversation; and the day to be closed with scripture reading and family prayer—the master of the house, according to scripture, having to officiate as priest in his own family. I name religious reading: the number of exceedingly good and attractive books for Sunday reading is immense; and with the various periodicals and magazines, no family need be long in providing a suitable supply of readable books. "The Sunday at Home" (1d.), "The British Workman" (1d.), "The British Messenger" (1d.), are excellent little weekly publications; and for other similar ones their name is Legion.

THE MALT TAX.

Sir James Graham once said, "He was convinced if they repealed the corn laws, the malt-tax would not survive a single year." Mr. Villiers responded, that "of this he was sure, that all those who were now injured by the existence of the corn laws, would be ready, nay, be anxious to get rid of the malt-tax." Lord John Russell coincided, by declaring, "If I were Prime Minister when protection to agriculture was abolished, the first tax I would repeal would be the malt-tax." And Sir Robert Peel urged "as a farmer, let me manufacture and consume my own malt untaxed;" and added, "Can you deny the justice of this appeal?" Most assuredly we cannot; nor can we understand why such fair promises from the leaders of the Liberal party have been so signally forgotten. The malt-tax still flourishes on, in all its noxious proportions. Every one knows it is a curse, knows that it is an unfair incubus upon the business of a farmer, that it debars the labourer from beer, and causes him and his brother-artizan to be poisoned with the pot-house near by. Every one knows this, and a score of other evils in the long train of industry injured, returns lessened, and crime produced. No one pretends to deny it, but where is the hero to lead in the cause? It is not the payment of the tax, but the consequences of the tax which are the especial curse. Bad enough to pay £6,000,000 sterling per annum we know, but far worse to straiten an industry, poison a people, and fatten the fraudulent in addition. 'Tis a cause that only wants a Garibaldi; and Italy itself was not more ripe for the liberator twelve months since than England at the present moment to be freed from such an impost.

Dr. Letheby has just recently reported to the Commissioners of the City upon this subject. He says: "In some cases of adulteration the practice of it has a far more extensive relation to the affairs of the community than at first sight appears. To take the sophistication of beer and porter as an instance; it is well-known that the publicans, almost without exception, reduce their liquors with water after they are received from the brewer. The proportion in which this is added to the beer at the *better class of houses* is nine gallons per puncheon, and in second-rate establishments the quantity of water is doubled. This must be compensated for by the addition of ingredients, which gives the appearance of strength; and a mixture is openly sold for this purpose. The composition of it varies in different cases, for each expert has his own particular nostrum. The chief ingredients, however, are a saccharine body, as foots and liquorice, to sweeten it; a bitter principle, as gentian, quassia, sumach, and terra japonica to give astringency; a thickening material, as linseed, to give body; a colouring matter, as burnt sugar, to darken it; *coculus indicus* to give a false strength; and common salt, capsicum, copperas, and Dantzic spruce to produce a head, as well as to impart certain refinements of flavour. In the case of ale, its apparent strength is restored with bitters and sugar-candy. Now, apart from the question of how much injury is done to the health of the consumer by this practice, or how large is the fraud on the pocket of the purchaser, it is a matter of interest to know what is the effect of it on the revenue. There are, I believe, about 6,200 publicans and beer-retailers in this metropolis. Supposing that each, on an average, has a sale for only six barrels of beer and porter per week, and that the degree of dilution is but to the extent of five gallons of

water per barrel in the aggregate, there would have been used 186,000 gallons of water per week. This, if properly and honestly brewed into beer, would have required about 1,722 quarters of malt: and as each quarter of malt pays a duty of 22s. 6d. to the revenue, there is a fraud of rather more than £1,937 sterling per week, or nearly £100,000 per annum. In like manner almost every such fraudulent practice of trade has a wider relationship to the public interest than the mere act itself would imply.

To apply Dr. Letheby's calculation to the entire kingdom, not less than £2,000,000 sterling are extracted annually from the pockets of poisoned consumers, to support fraudulent producers. 'Tis the labourer and the labouring classes, too, who mainly support this crew of indolent knaves; and, truly, the British public are strange philanthropists; for they consent to entrap the labourer to drunkenness and crime and poverty, upon the principle "The more snares, the more hares," and then, to make reparation, educate the son, at no small outlay, to ensnare him, in his turn, to his father's vices. Surely, a good father is the best instructor. Education is good; but example beats instruction hollow. Make home comfortable; give home-comforts; cut off the inducement for pot-house resort and the premium on pothouse decoctions. This is wise legislation. We cannot afford to retain a law which makes the publican a rogue, and the public drunkards.

To show the effects of the malt-tax upon the industry of the kingdom, we give the following ascertained facts, which are based upon the interests neither of a section nor a class, but upon the broader basis of the interests of the public at large in the question:

	£
Tax annually paid.....	6,000,000
Payments to adulterators.....	2,000,000
Consequent loss, in time, health, and crime....	2,000,000
Ditto increase in penal and paper charges....	1,500,000
Injury in preventing the maling of inferior barley and other corn, whereby to increase its consuming value.....	4,000,000
	£15,500,000

Thus, for a net tax of £5,000,000, the bone and muscle of the kingdom pays, directly and indirectly, £15,000,000, or 300 per cent. Such legislation cannot be the combined wisdom of an enlightened people. It cannot be wise to drug the consumer; to injure the barley-producer; to increase and perpetuate wretchedness, immorality, and criminality; and all for the purpose of raising a revenue at the frightful sacrifice of 300 per cent.! Individual prosperity could not be purchased at such a price; and Great Britain cannot afford to extort from her people on such bankrupt terms. It is even rumoured that Mr. Gladstone proposes to increase the malt duty. Such an act cannot be tolerated; and it is with pleasure we record the operations of the Malt-tax Repeal Association. Never has this question been agitated since the introduction of free trade. The reduction of the wine duties has strengthened the justice of the abolition cause; the spirit of the age is, justly, for increasing the comforts of the labourer; and we believe a combined movement of the masses can speedily accomplish a total repeal of the duty. Let the movement only be prosecuted and supported with vigour, and success is sure.

THE COW AT CALVING TIME.

It is of great importance to every cow-keeper and cattle-breeder that the proper treatment of cows, as breeding animals, should be fully understood, and carried out in every department of their management. It is wrong to put heifers to breeding purposes too young, whether intended for the dairy or the herd. It retards their growth, and weakens their constitutions. Heifers ought to be at least two years old before they are allowed to go to the bull, more particularly if intended for the dairy, as generally the cow has to yield one or two meals of milk daily whilst nourishing her future calf. The suckling cow is seldom milked dry by her calf, and has therefore a better chance of supporting the foetus, or future calf. In all cases of breeding animals they should only be kept in safe ordinary condition, neither too fat nor too lean. For this purpose the cow, as calving time approaches, should be better fed, so that the nourishment necessary for the foetus should be counterbalanced by the quality of the food given. She should be kept in a quiet undisturbed state for at least three months prior to calving, having been previously "dried" for that purpose.

As the time of calving approaches (which every breeder may ascertain by recording the date of bulling, and counting on about forty or forty-one weeks, or 280 days, the period of gestation,)* she should be separated from the herd in the Summer to a convenient paddock: in the Winter to a warm, clean, and well-ventilated hovel, or barn, where she should be constantly watched, and well, but not profusely fed. As "labour" comes on, and which may be anticipated by the falling of the flank, and depression of the croup, she should not be disturbed, but for a time left to her own natural efforts. When in the judgment of the herdsman the calf is sufficiently advanced to be felt, he should gently insert his hand in the uterus, to ascertain that the presentation is right, *i. e.*, that the two fore feet and the nose of the calf can be felt; if so, she may be left a reasonable time to deliver herself, but he may occasionally assist a little. Should the labour be somewhat protracted, he must then summon assistance, and take the calf away, otherwise the strong continuous paining of the cow will frequently kill the calf ere it is born. The common course pursued in taking away a calf is to cause the cow to stand up, and then to draw a little forward the feet, and fasten around the legs and above the first joints a cord of sufficient strength and such pliability as not to bruise the legs. The hand or fingers should then be inserted, so as to place the head or nose right, *i. e.*, just upon, or rather slightly between the legs. The assistants may then gently draw the legs forward, and bearing the cord

downwards; the herdsman meanwhile endeavouring to push gently back any portion of the uterus brought prominent by the head, and aid by gentle means as he best can the delivery. As soon as the calf is brought forth its nostrils should be immediately cleansed from adhering mucus, the mouth opened, and when it has breathed freely it may be rubbed carefully with a wisp and then presented to the mother, who will at once lick it freely with her tongue, which acts as both brush and curry-comb most advantageously. In a few minutes it should be lifted up, be supported, and enticed to suck. If it sucks freely, very little danger is to be apprehended, and the dam and calf may be safely left together. Warm-water only should be given to the cow, and her food should be of a mild and nutritious character, avoiding cold roots or the like. The calf should be left with the dam at least three days, in order that it may draw its food at first naturally, and as it requires it. By this time the first milk or beastlings, acting as a gentle purge, will have passed through its bowels, cleansing them of all mucus; it may then be safely removed to the calf-house to be brought up by hand if required.

In cases of wrong presentations the cow should be carefully examined by inserting the bare arm as far as possible into the uterus. Upon ascertaining the position of the calf, such judicious means must be adopted to get it away as the best judgment dictates. In a presentation, when the hinder parts come first, the calf may occasionally be drawn away; but generally in such presentations the legs are doubled backward; it is then necessary to push the calf back into the womb or calf-bed, and if possible turn it, or get forward the legs, for it cannot come forth doubled up as it is: in either case, it is a most difficult task to get it away safely, and often results in the death of both dam and calf. In difficult cases, it is best to send for the veterinary surgeon, who, of course, has most practice. In my own business, I use a very homely instrument for pushing back the calf into the womb. It is the shaft of a spade or shovel. The hilt serves for a shoulder-crutch; and the bottom of the shaft is cut into a little hollow, or curve. This little hollow is placed just under the tail of the calf, so that the sides press on the tuts of the calf. The shoulder is then applied to the hilt; and by a very gentle, persevering push, it is forced back. The arm is then inserted, and an attempt is made to bring forward the feet, or, if possible, the head and fore-feet. This, however, is generally impossible: however, the hind-feet may usually be got forward; but the turning them from their bent position is almost sure to lacerate the womb, and cause death. Something, however, must be done; and it is worth the trial—it does not always end fatally.

In extremely violent cases the womb, or calf-bed, will protrude and fall down. This is a very difficult

* M. Tessier reports the result of observations upon 160 cows; 14 calved from 241st to 266th day; 3 on the 270th, 50 on the 280th, 68 on from the 280th to 290th, 20 on the 300th, and 5 on the 308th.

thing to restore, with safety, to its proper place, owing to the continual paining of the cow. It should be well washed in warm water as quickly as possible, before it has much time to swell. The herdsman should then, with his doubled fist, proceed to push it into the uterus, where it must be secured by strong ligatures sown across the opening. The cow should have a strong dose of laudanum, to quiet her for some hours, so that the calf-bed may have time for the swelling to subside. Subsequently, she should have a little warm water, with some meal stirred in. This should be given repeatedly, but sparingly, so as not to load the stomach. No heating nor any purgative drenches should be given. The great thing is, to keep the cow quiet.

The discharge of the afterbirth is not of any great moment. Cows partially exhausted by calving will be a long time before they pain themselves so as to cause the expulsion of the afterbirth. I have never known any great harm arise from its remaining even for some days. I had a cow calve on Saturday, the 16th inst.: the afterbirth did not come away till Tuesday, the 19th inst.: but no harm ensues. The cow evidently tried to save herself the pain it might cause her. Generally, this "cleansing" comes away, without much effort on the part of the cow, in a few hours. It may be left to its natural chance for several days. Should it become necessary to draw it away, a veterinary surgeon should be employed to do it, as it is generally owing to some unknown adhesion or growth to the womb.

When the cow has had a protracted and difficult calving time, she will require careful treatment. In common natural cases she will soon be all right; but in difficult cases brushing of the belly and loins with a wisp is serviceable—gentle walking exercise for a short time in fine weather. Gruels and cordial drinks should also occasionally be given. The latter might consist of a quart of ale mixed with sugar or treacle, and diluted with water, to be given warm. The old "cow-leech's" drench is, 1 oz. aniseed powdered, 1 oz. sulphur ditto, 1 oz. liquorice ditto, 1 oz. diapeute ditto, 1 oz. long pepper, given in a quart of warm ale. She must have her warm water mixed with a little meal, as above stated. Should fever intervene, it is best to send for the veterinary surgeon, and commit the case to his care. It is important not to confound the weakness which depends upon exhaustion with that which depends upon oppression only. The former requires medical treatment, the latter may be restored by cordials and suitable food, &c. The former will require most probably bleeding and cooling drinks, and possibly emollient clysters.

Cows after calving should be carefully fed with nutritious food, in small quantities often repeated; and it is certainly best to give cooked or boiled food, as it prevents more generally indigestion and flatulent cholera. At all events sweet and easily digested food should be given, or material injury may arise. Should the udder swell from excess of milk, or the incapacity of the calf to draw it all away, frequent milking is requisite, and it

should be hand-rubbed well, with frequent washings of warm water and soft soap, or with warm bran water. The teats occasionally become sore: the same applications should be resorted to, and, in addition, a little lard, olive oil, or even cream, should be gently rubbed on, particularly in cases of pustules arising, or scab. I trust these simple rules and hastily drawn up remarks may be useful; but if they only have the effect of calling a little more attention to this much-neglected department of farm practice, I shall be abundantly satisfied.

MINERAL MATTER REQUIRED FOR THE GROWTH OF THE FOLLOWING CROPS.
(SPECIALLY PREPARED FOR THE MARK LANE EXPRESS.)

	Swedes.	Wurzel.	Carrots.	Potatoes.	Clover Hay.	Wheat.	Barley.	Oats.	Beans.	Pear.	Rye.
	Roots 20 tons, leaves 3 tons.	Roots 30 tons, leaves 6 tons.	Roots 15 tons, leaves 3 tons.	8 tons.	2 tons.	Corn 30 bush., straw 35 cwt.	Corn 35 bush., straw 30 cwt.	Corn 40 bush., straw 30 cwt.	Corn 25 bush., straw 25 cwt.	Corn 25 bush., straw 15 cwt.	Corn 30 bush., straw 30 cwt.
Silica	lbs. 10-85.	lbs. 20-85.	lbs. 18-6.	lbs. 7-8.	lbs. 11-5.	lbs. 14-0.	lbs. 10-6-5.	lbs. 12-3-5.	lbs. 6-4.	lbs. 6-5.	lbs. 65-3-4.
Phosphoric acid	42-3.	32-3-5.	21-2.	23-3.	29-.	25-4.	19-7.	14-4.	26-8.	17-5.	15-4.
Sulphuric acid	56-5.	35-8-5.	40-1.	25-3.	19-.	6-4-2.	4-2-2.	7-4.	7-.	8-3.	1-0-1.
Lime	67-1.	26-8-5.	14-4-2.	3-8.	10-1-.	12-9-2.	15-.	18-5.	37-.	4-4-3.	10-1-2.
Magnesia	12-5.	23-9-5.	21-5.	9-8.	31-5.	8-3.	10-7-2.	11-6.	10-5.	10-0-6.	5-2-1.
Potash	130-4-5.	215-15.	120-8.	103-1.	48-.	32-6-4.	40-2.	48-.	52-.	33-9.	23-8-5.
Soda	31-8-5.	108-6.	76-6.	3-5.	9-.	2-2.	2-6-9.	21-2-5.	7-7.	2-9-5.	2-3-1.
Peroxide of iron	3-5-5.	6-1.	11-3.	1-.	5-.	1-2-5.	12-6-5.	4-.	1-5-6.	2-2-3.	1-6-7.
Chloride of sodium	46-0-5.	27-4-9.	64-5.	12-.	12-.	2-.	5-9-6.	1-.	14-8-6.	4-2-6.	4-6.
Chloride of potassium	5-5.	—.	—.	—.	—.	—.	—.	0-7.	1-4-6.	5-3.	—.

SALE OF SHORTHORNS IN SCOTLAND.

On Thursday, Feb. 14, Mr. Sylvester Campbell, of Kinnellar, Kintore, sold his shorthorns, by auction, at the following rates :—

BULLS. GUINEAS.

Garibaldi, roan, calved Dec., 1859, by Scarlet Velvet—Mr. Walker, Wester Fintray.....	67
Wartie, red and white, calved 13th January, 1860, by Scarlet Velvet—Mr. Ledingham, Hayhillcock, Ellon.....	37
Darlington, roan, calved 18th Feb., 1860, by Lord Scarbro'—Mr. Gilchrist, Wells of Rothie, Fyvie.....	28
Balmoral, red, calved 1st March, 1860, by Scarlet Velvet—Major Duff, Knockleith, Auchterless.....	27
Royal George, red, calved 3rd March, 1860, by Scarlet Velvet—Mr. M'Lennan, Meikle Urchany, Nairn.....	39
Prince Alfred, red, calved 15th March, 1860, by Scarlet Velvet—Mr. Lumsden, Braco.....	30
Statesman, roan, calved 18th March, 1860, by Lord Scarbro'—Mr. Douglas, Auchrony, Kinnellar.....	31
The Hero, red, calved 21st March, 1860, by Scarlet Velvet—Mr. Argo, Eggle, Belhelvie.....	45
Snowdrop, white, calved 12th March, 1860, by Lord Scarbro'—Mr. James Cooper, Canniegierick, Drumoak.....	21
General, roan, calved 1st April, 1860, by Lord Scarbro'—Mr. George Fowler, Invercammy, Fyvie.....	21
Atlas, roan, calved 17th May, 1860, by Scarlet Velvet—Mr. Charles Rankin, Candy, Glenbervie.....	17
Young Major, red, calved 4th June, 1860, by Scarlet Velvet—Mr. Strachan, Kirkhill.....	28
Twin Bull, roan, calved 6th July, 1860, by Scarlet Velvet—Mr. Brochie, Swanney House, Orkney.....	18
Stanley, roan, calved 26th July, 1860, by Napoleon, Son of Garloch Bor—Mr. Thom. Quithil, Durris.....	20
Earl of Rossie, red, calved 22nd March, 1859, by Cherry Duke Second—Mr. F. Alexander, Farmton, Alford ..	36

HEIFERS.

Miss Ramsden the Third, roan, calved 27th Feb., 1860, by Scarlet Velvet—Mr. James Abel, Burnside, Kintore.....	10
Rose Leaf, red, calved 13th April, 1860, by Lord Scarbro'—Mr. Dempster, Oldmachar.....	19
Dandy, red, calved 12th April, 1860, by Scarlet Velvet—Dr. Trail, Tombeg, Monymusk.....	30
Duchess, roan, calved 4th April, 1860, by Lord Scarbro'—Mr. Alexander, Farmton, Alford.....	26
Rose of Summer, red, calved 7th June, 1860, by Scarlet Velvet—Mr. M'Lennan, Meikle Urchany, Nairn.....	30
The rose, red, calved 13th June, 1860, by Scarlet Velvet—Mr. Marr, Uppermill, Tarves.....	25

Half-a-dozen cross stots, rising three, and four cross heifers, two years old, sold, the former at from £23 to £26; the latter at from £19 to £20.

Mr. Scott, of Glendronach, on the following day, had a sale of his shorthorns, by auction, when the following were disposed of :—

BULLS. GUINEAS.

Lord Stanley, roan, calved August 17, 1859, by the Earl of Errol—Mr. Simpson, of Cobairdy.....	31
Napoleon, roan, calved Feb. 11, 1860—Mr. Forbes, Thorniebank, Auchterless.....	27
Lord Clyde, roan, calved March 8, 1860—Mr. Lague, Midtown of Haddo.....	35
Prince of Wales, roan, calved March 2, 1860—Mrs. Leslie, of Kinbroom.....	39
Garibaldi, roan, calved March 25, 1860—Mr. Cran, Brae of Gerrie.....	40
Havelock, red, with a white spot on side, calved 22nd Dec., 1859—Major Gordon Duff, of Drummuir.....	20
John Balfour, roan, calved February 5, 1860—Major Gordon Duff, of Drummuir.....	31
Deveronside, red, calved Nov. 10, 1859—Mr. James Low, Netherton.....	29
King of Tramps, roan, calved March 16, 1860—Mr. Findlater, Crammah.....	21
The Laird, rich roan, calved June 1, 1860—Mr. Benzie, Parkbrae, Oyne.....	20
The Factor, rich roan, calved July 14, 1860—Mr. Reid, Newton of Kinnethmont.....	24

COWS.

The Queen, roan, calved in April, 1855—Mr. Watt, Crombie Mary of Orbliston, roan, calved in 1854—Mr. Jamieson, Haughs.....	35
Daisy, light roan, calved in 1852—Mr. Walker, Drumblair.....	27
Fair Maid, dark roan, calved in February, 1857—Mr. Alex. Strachan, South Haddo.....	30
Coroline, roan, calved in 1855—Mr. Joss, Cruiche.....	29
Jeannie Deans, roan, calved in 1856—Mr. A. Bruce, Keig.....	26

HEIFERS.

Flower of Moray, rich roan, calved 14th April, 1858, with calf at foot—Mr. Walker, Craignethery.....	29
Queen of Diamonds, calved 21st July, 1858—Mr. Bruce, Broadland.....	21
Miss Geddes, dark roan, calved 29th October, 1858—Mr. Lawson, Lessendrum.....	19
Mina, light roan, calved 23th March, 1859—Mr. Cruickshank, Bainshole.....	21
Agnes, red and white, calved 4th June, 1859—Mr. Wilson, Durn.....	19
Lilias, roan, calved 22nd Sept., 1859—Mr. Wilson, Durn.....	16

The average of the eleven bulls is £30; of the six cows, £31 17s.; of the heifers, £22 1s. A cross cow and calf sold at £27 15s., and twelve stots and queys, rising two years, sold at an average of £18. The gross amount of the sale was £900.

DEATH OF A PRIZE SHORTHORN.—“The Queen of Athelstane,” the first prize yearling heifer at the Dumfries Meeting of the Highland Society, died during the past week, when she was just two years old. This really beautiful heifer was bred by Mr. Douglas, of Athelstane, and by Sir James the Rose, out of Ringlet, by Frederick, her dam Pearly by Royal Buck. We had to speak of her in high terms in our report of the great northern meeting, where the Queen also attracted the notice of Lady Pigot, who subsequently brought her South at the long price of five hundred guineas, and in whose possession the heifer died at Branches Park. She was said to be in calf to Lord of the Valley. The cause of her death was inflammation of the bowels, not the unfrequent end of over-fed cattle, either from indigestion or on any exposure to cold. Her ladyship has only recently lost another promising heifer called Ethelgiva, from the same cause, out of Duchess of Gloucester the 2nd, a prize cow at Canterbury; and Lucy, another of Lady Pigot's herd, bought at Wetherell's sale, for 150 gs. was killed, at Christmas, as butcher's beef. Her ladyship feeds high, and it was only during the past year that we had to notice her exhibiting a heifer in one week as a fat beast, and in the next as a breeding animal! Mr. Douglas also brings his stock out very full of flesh, and as a consequence his famous Venus de Medici has never qualified; while the sweet Maid of Athelstane, an own sister to the Queen of Athelstane, stood amongst the extra stock at Dumfries from never having had a calf. What a commentary all this is on our remarks of last week, on Mr. Fawkes's protest, and on Mr. Carr's letters. Of course, the poor Queen of Athelstane was in training for the Leeds Meeting, or in other words, being pampered up like a bilious alderman, or an over-crammed turkey, who drops down with the last ball of barley-meal in his throat. What really is the meaning of “bringing an animal out properly for showing?” Would not killing be a better reading of such a state?

DEATH OF MR. BAKER, OF COTTESMORE.—

We regret to record the decease of Richard Westbrook Baker, Esq., which took place at his residence at Cottesmore, on Wednesday, the 30th of January. For the lengthened period of forty years this gentleman has been an occupier of land in the county of Rutland, and during the whole of that time every solid improvement in agriculture has had his earnest support and assistance. The system of small allotments for agricultural and other labouring poor has reached its greatest perfection in the county of Rutland, where it was established thirty years ago by Mr. Baker. The Friendly Society, the Cottesmore Ploughing Meetings, the Agricultural Society and Hall at Oakham have long borne substantial evidence of his interest in their prosperity. We shall hope hereafter to present our readers with a more complete sketch of Mr. Baker's career as an agriculturist. We can only say here, that he has died in the esteem and respect of a large circle of friends, who will long lament his loss, and miss the assistance of his clear judgment and thorough practical knowledge in connexion with those public matters with which he has been for so many years actively associated.

AGRICULTURAL STATISTICS.

On the 2nd Feb. the monthly meeting of the Newcastle Farmers' Club was held. Mr. Weeks occupied the chair.

The CHAIRMAN stated that Mr. Chrisp intended to introduce the subject of passing resolutions as to the benefit of a general system of agricultural statistics of the united empire.

Mr. CHRISP said that, although he had undertaken to bring the matter before the club, he did not think he was able to throw much light upon it. This was the year when the census of the population was to be taken; and it appeared highly desirable that some move should be made to ascertain the produce of the land, as well as the number of people. He had certainly expected a greater number of individuals would have been present at this meeting to make their objections; but, as they had kept away, it showed that they had none to make. The only objection that had been suggested to him, in connection with the subject, was the publicity that would be thrown upon private affairs. As far as Scotland was concerned, where the returns were taken for three years, he knew it to be the reverse; in fact, Mr. Hall Maxwell (secretary to the Scottish Agricultural Society) had reported that the suspicion of inquisitorial or private interference was entirely done away with; but, in consequence of an unfortunate misunderstanding between that gentleman and the Audit Board, the Government grant was withdrawn in 1857. In Ireland the agricultural statistics were regularly returned, he believed through the police, and registered; but he did not intend to advocate any particular mode of obtaining them, although he thought they had better be taken by each individual farmer; and this plan would incur less expense to the country. The return of the acreage could be obtained before the harvest, but the quantity of grain yielded could only be ascertained after the harvest was over. The only objection, he repeated, to the returns, that he had heard of, was that it would expose the affairs of each individual farmer to the public. That course, however, had never happened in Scotland, where there were a certain number of enumerators for each individual district. The returns were completely private, and there had never been any suspicion of publicity given to any farmer's affairs in Scotland. His opinion was that instead of such a number of enumerators making a personal inspection, it might be better if the numbers were taken by schedules, and through the Poor Law Board. The acreage could easily be taken in that way, and the only difficulty that could exist would be to obtain the quantity per acre. He had no doubt any farmer would give it to any official who was under the same secrecy as an income-tax commissioner, and upon the understanding that it was not to be divulged except as regarded the quantity in each district or county. He had also very little doubt that it would entail only a small expense to compensate the persons for the extra labour which devolved upon them. He did not advocate that these returns should be obtained every year; but, perhaps, after a trial, it might be well to do so. But this year, being the year appointed for the taking of the census, he thought the acreage might be ascertained at the same time without any additional expense. He thought that it was as necessary to ascertain agricultural statistics, to show the public the quantities of the crop, as it was to let them

know the number of people. His object was to obtain a proper account of agricultural statistics, instead of having those of a particular description, such as the guesses that appeared in the newspapers. Every year there were attempts by the newspapers to state what was the production of the crops, and they were very wide of the mark; at least if they took Scotland, where they were supposed to be pretty accurate, it was found that they differed materially from the statements of Mr. McCulloch, who was considered at one time to be an authority in these matters. If some sort of guess was found to be necessary, it would be better and easier to give the truth as near as they could approach to it, instead of taking surmises from the papers. He found from a report he held in his hand that the acreage was actually taken in Scotland about July or September; the quantity per acre and gross produce was not ascertained until the first week in December. He mentioned this to show that they must not expect over much from the returns; and if they were taken during the autumn it would be impossible to influence the markets more than the season would do. The acreage would be produced for the public before the harvest, but the yield could not be shown before Christmas. He did not wish to exaggerate the importance of the returns, yet, at the same time, he thought that an accurate report of the statistics would materially benefit the public instead of the surmises that were every year published. He wished to press upon them the necessity of passing the following resolutions, so as to remove the stigma to which the agricultural classes had been subject in this country. The first was, that "We deeply regret the want of accurate accounts of the annual produce of arable land, and the amount of live stock, which are so necessary to enable us to form an opinion respecting the value of modern practices in the management of the soil, as well as the general progress of agriculture in the nineteenth century." Second, "We consider a well-devised system of agricultural statistics as being essential to supply this information, so desirable to agriculturists as well as to statesmen." Third, "We deem the present year, 1861, as being a peculiarly opportune time for the commencement of such an enumeration, along with that of the population of the United Empire of Great Britain and Ireland." Fourth, "We therefore respectfully urge upon the executive, the Legislature, as well as the landed interest, to use their endeavours to supply the information for this kingdom, which is given by almost every nation of Europe, and even by our most distant colonies." There were scarcely a nation which did not have regular agricultural statistics. He had seen reports from Australia, and other countries; and why they should be omitted in England he could not conceive. He believed that a jealousy existed, and it would be well to ascertain where the evil was. If they were to have knowledge it should be correct, and not surmises. The speaker concluded by moving that the above resolutions be passed, and invited the opinion of those members present.

Mr. GLOVER, the secretary, said, whilst admitting the necessity of agricultural statistics, the difficulty that presented itself to him would be how to obtain them. They had certainly been successful in Scotland, through the instrumen-

tality of Mr. Hall Maxwell. He did not see why they should not have them, but the difficulty would be to get the farmer to give the returns. The matter had been discussed over and over again; and he thought if they had a proper mode of obtaining the statistics, it would be a great boon to the country. He believed that the machinery adopted in Scotland was sufficient, and the same might be adopted in this country; that was through the farmers themselves. He could not see what jealousy there ought to be in giving the returns, because every one must be awake to the importance of knowing the actual produce of his farm. With all due deference to Mr. Chrisp, however, he would ask him to withdraw his resolutions; because he thought it would not be wise for the meeting to pass so serious a set of resolutions, as to choose the parties to do the work.

Mr. CHRISP replied that the resolutions did not confine it to any particular form. He had cautiously avoided making any plan by which to obtain the statistics.

Mr. GLOVER—Do you propose that the resolutions be forwarded to anybody?

Mr. CHRISP—No: I can scarcely go so far. I think it would be sufficient to let it go forward in a newspaper account.

Mr. SAMPLE—Do you not think it might be well to send it to each Farmers' Club throughout the country?

The CHAIRMAN observed that that question could be discussed after the motion was put.

Mr. WILSON thought that, before they could obtain the information they would require, they would have to prove to the farmers that it would be an advantage to them. For his own part, he could not see what advantage it would be at present to the British farmer, although it might be to the general public.

Mr. CHRISP observed that Mr. Lawson, who was to have seconded the motion, was ill, and could not therefore attend; but he understood that he had devised a plan by which to obtain the returns. He had no doubt that a very satisfactory plan would be traced out, which was the reason that he had avoided suggesting any. He did not wish them to understand that he wanted the returns to be obtained by any Board of Guardians, but by the officials of the Poor Law Commission. He thought that if every man was to give his own return acreage, and then to get the return of the average quantity in November, and forward it to a proper person to be appointed, all private affairs would be excluded from the public, because that officer would be in the same position as a tax-collector.

The CHAIRMAN concurred in the necessity of obtaining agricultural statistics, but would advise them not to have any dealings with the Poor Law Commissioners upon the point. He also agreed in the view advanced by Mr. Wilson, and believed that some difficulty would be found in persuading a farmer of the benefit he would derive from the measure.

The motion having been seconded by Mr. Sample, was carried unanimously.

Some discussion took place about forwarding a copy of the resolutions to the Farmers' Clubs throughout the country; but the consideration of this matter was ultimately postponed, in order to allow time for a series of questions to be drawn up to be put to the different societies, soliciting opinions.

A vote of thanks to Mr. Chrisp and the Chairman terminated the meeting.

IMPORTANT TO BREEDERS—A PROTEST.

Every one of us has his weak point. If we be not sallying forth to succour beauty in distress, or couching a lance at a windmill, we may still be as easily identified with some pet partiality or prejudice. One man shall have a taste for toasted cheese, and another a horror of black stockings. The otherwise best and quietest of hacks will do anything but face a wheelbarrow, and the most dutiful of daughters yield to an unconquerable weakness for her music-master. A good citizen *must*, nevertheless, be always in hot water with the parson of his parish; a too-intimate acquaintance with the currency question has brought many such a student to grief; while old Beppo, commonly the sweetest-tempered of house-dogs, goes raving wild with rage at the sight of a red cloak or a stray donkey.

Let us couch our lance once more. Or, avert our gaze as the well-spread crinoline displays an inch or two of that sable hose. Or, fly in fear from the gardener's barrow; or rush irate on the travelling tinker's much-enduring friend. What is it that we would avoid so carefully, or attack so furiously? Strange as it may sound, what many of our friends love so much. Our great antipathy, our invincible aversion—the red cloak of Beppo, or the black stocking of Benedick—is the too well-fed beast. For years now have we been protesting

against this manifest abuse of the show-ground. There has been scarcely a great meeting during the past one but we have made it a duty to refer to the evil. Here, "breeding" pigs die of positive suffocation. There, the best bull has been pampered up to a condition of thorough sterility; while cows in calf are so fattened, simply, as it would seem, to endanger their own lives, or to deteriorate their produce. But it was in vain that we continued to complain. The most spirited Shorthorn-breeder of the day, the late Lord Ducie, had himself denounced the practice, and had failed to correct it. His fellows would not support him. "It was impossible to make such restrictions," or "to give such instructions." The entries would fall off, and a leading exhibitor at once went so far as to decline showing, unless he were permitted, without prejudice, to feed his cattle as highly as he could.

The consequences are such as might have been anticipated. Encouraged to deceive the judges and mislead the public, successful men have resorted to the most extraordinary devices. One lot of animals have been kept at home to breed from, and another set brought out for competition. Cows that never had calves have been, wittingly or unwittingly, distinguished at Royal meetings; and judges, in their integrity, have

absolutely selected bulls that they must have known had already been condemned as worthless and impotent. Of course the punishment must ultimately recoil on the head of the offender. Some of our best breeds of stock are getting a bad name. Rumour is busy declaring that animals purchased at long prices have been shipped to Australia and America, where, to the cost of the victimized, it was discovered they were utterly useless. The abuse of over-feeding had thoroughly incapacitated them for any other purpose than feeding, and hence the chief feature of our Show grounds is slowly but surely working on to *nil*. The whole thing is artificial and injurious, conducing only to an advertisement that must be read with caution and distrust.

It is but a few weeks since that Mr. Sotham, writing from America, drew a very startling picture of what this abuse has come to. In one sentence he says "the forcing system has been nothing but deception from beginning to end, and has led to all the other evils connected with this kind of show." But Mr. Sotham may have had prejudices in one way and partialities in another — against the Shorthorn and in favour of the Hereford. Indeed, it is in this spirit that his letter is taken up by "A Member of the Royal Agricultural Society." But the latter, with some imprudence, centres his attack on Mr. Carr. It is Mr. Carr who has excited the wrath of the "Member of the Royal Agricultural Society." And it is this same Mr. Carr who, as our readers will remember, has done more to remedy the evils and actual dishonesty connected with the breeding and selling of Shorthorn stock than any member or non-member of the Royal Agricultural Society that we know of. Curiously enough, Mr. Carr's offence is exactly the reverse of Mr. Sotham's, who has a partiality for Herefords, while Mr. Carr is "puffing his own honesty as a Shorthorn breeder."

But when the "Member of the Royal Agricultural Society" was writing down this charge, he must have surely overlooked an article headed "The Overfeeding of Shorthorns," and declared to be by Mr. Fawkes, of Farnley; while it runs on in this tone:—"You have at all your shows, and in the commendations and premiums that you have bestowed, encouraged, nay, insisted on, as a requisite to successful exhibition, a condition of the animal which all experience and all authority on the subject tells us will be prejudicial alike to its powers of calf-bearing and milking, will prevent all usefulness in the cow, and is preparing the heifer for no other power of profit to its owner than the prematurity of its prize beef, and the posthumous, but very questionable—so far as its possessor's advantage is concerned—honours of the shambles. * * * "My own experience, as well as that of all the practical men of the past, as well as of the present age, to which I have had access, assures me that the indisputably unnatural show-condition of the animal, as you teach us to consider it, is anything but that state of its being which, whether in the heifer or the cow, can benefit the public, or permit its owner the profitable exercise of his calling and his capital." *

* * "The best and most useful cows of every herd must be—as long as you adhere to the system of making a gaudy condition of the animal a *sine quâ non*, as now, to its success—of necessity left at home, from their inability to have been, previously to the show, performing two irreconcilable processes at once, of putting on your condition, and doing their duty with profit to their owners." Considering there could have been no possible collision between the two—remembering that they are assumed by many to write with very different objects in view, it is curious to see how strongly Mr. Sotham and Mr. Fawkes go to confirm each other's statements. What is there that Mr. Sotham advances which Mr. Fawkes does not support? Does not either maintain that the present system of overfeeding Shorthorn stock is tending to nothing but fitting prize beasts for "the posthumous but questionable honours of the shambles?" And does not Mr. Fawkes proceed to demonstrate that, whether better or worse, you must, under such circumstances, have two sets of animals—one to show, and the other to breed from? If the Member of the Royal Agricultural Society quarrels with Mr. Sotham or Mr. Carr, he is certainly quite as much at variance with Mr. Fawkes. And who is Mr. Fawkes? Himself a breeder and successful exhibitor of Shorthorns, who we shall most likely hear is "puffing his own honesty," because he has written a straightforward and telling letter, in his own name, against the perpetuation of an abuse that is surely damaging our national credit with the world, whatever a few short-sighted people may profit by it.

Let us echo Mr. Fawkes a little further in an exhortation so thoroughly in accordance with our own views, and that, in its substance, we have so often offered:—"You will scarcely, I should think, hazard (were you adventurous enough) to attempt a defence of these proceedings, involving that intelligent class of farmers from whom your judges are selected, in the contempt that would devolve upon the argument, 'that to assure yourselves of the propriety of their awards of your premiums, form, frame, and quality are not enough, but the fleshy condition of the animal presented to you can be the only safe index to the futurity of fat either in itself or its progeny.' And here I may ask you to reflect of what useful instruction to the young farmer you are by the permission of this show condition depriving yourselves; for what can be more important for the young farmer to know, what more advantageous to him, that he should learn, by a process less costly than his own unaided experience, how to select for purchase in the lean fairs the animals that are most calculated to realize his expectation on their re-sale in the fat markets?"

Mr. Fawkes addresses his letter to the Council of his own county Society. The meeting of the Yorkshire, however, merges this year into that of the National Show; and consequently, with permission, we would re-direct his communication to the Council of the Royal Agricultural Society of England.

CALENDAR OF AGRICULTURE.

Sow oats and barley on dry lands, and during dry weather; also spring wheat, vetches, peas, beans, and flax seed. Sow lucerne on well-prepared ground, trenched or deeply ploughed, and richly dunged. Sow carrots and parsnips, best on loamy sands and loams, in good condition from previous treatment, without the present application of fresh manure. Steep the seeds in leys of urine, and encrust with hot lime. Sow sainfoin, and dress the young plants with gypsum. Apply artificial manures as top-dressings on young wheats, barleys, and clovers—soot and salt, malt coombs, rape dust, nitrate of soda, pigeons-dung, and gypsum. Sow cabbage seeds for summer plants, and lay composts on grass lands in the early month.

Plant hops, and make the hills six feet distant each way; use well-rotted dung, and place four sets in each hill, one in each corner, and cover them lightly with earth, leaving the upper end of the set just in light of day.

Continue the planting of forest trees, and of young hedges, but cease if dry weather sets in. The cutting of underwoods will now be finished.

Watered meadows may now be stocked with light animals. Set traps for vermin, and spread molehills.

Plough fallows for green crops, and also clay lands for bare fallows, if the weather be dry. Shut up the fields that are intended for hay, and finish laying composts on grass lands. In wet weather thrash grains, and carry dung from the cattle-yards to the heaps in the fields.

In most situations this month will be the busiest lambing season. Feed the ewes amply with juicy succulent food, as beet, cabbages, and turnips; and use the necessary shelter, which in many instances is as essential as the food itself. The shelter sheds must be littered frequently to keep them dry—best with chaffs or very short straws. Remove the ewes and lambs to the pasture fields from the lambing paddock regularly, as the lambs get strong.

Keep the poultry houses dry and warm, and set all kinds of eggs for hatching; feed well, and provide clear spring water.

Finish the killing of hogs for bacon, and keep all young pigs for summer stores and for early fattening next winter. The latest fattening bullocks must now be sold, or pushed forward by superior feeding. The long days will now require a larger supply of food, as daylight induces animals to eat more.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Early in the month dig and manure plots of ground for the main crops of peas, beans, and all the summer vegetables; carrots on rich sandy earths, without any present manure; beet and parsnips on stronger grounds, with the dung placed low in the earth.

Make rich soils for cabbages, Brussels sprouts, the brocolis, cauliflowers, and kales. Cauliflowers require very rich grounds, with deep trenches of dung. Guano water is an excellent sprinkling over the young plants.

Transplant and sow for summer hearting cabbage. Sow a little Dutch red cabbage seed, and green curled savoy for Michaelmas.

Sow the best French lettuce seeds round spinach, and repeat this in small quantity every three weeks henceforth; in the meanwhile the winter prickly spinach will continue to yield freely for some months, if the weather prove showery.

Sow as early as possible in the month the true Spanish onions for large bulbs, and the Strasburg for more common kitchen use. The ground must be deep and rich. London leeks are soon to be transplanted.

Sow radishes on rich and light grounds, with moisture and warmth to push an early crop, for which a frame and lights will be advantageous. Sow during the month a sprinkling of Dutch turnip, a little celery for succession, small salading,

nasturtiums for pickles, parsley, basil, and pot herbs, namely fennel, dills, borage, burnet, and sorrel.

Plant thyme, sage, marjoram, lavender, rosemary, and rue.

Plant the early ash-leaved kidney potato—the next in the champion, prolific, and other sorts that ripen in August. Rich grounds without any present manure are best for avoiding the disease or murrain.

FRUIT GARDEN.

Prune fruit trees, and lightly fork the soil between the rows of currants, gooseberries, and raspberries, then cover the ground with leafy compost manure.

FLOWER GARDEN.

Sow the seeds of hardy annual flowers, after the middle of the month: dianthus, Indian pink, larkspur, and mignonette. The half-hardy are raised under frames. Herbaceous plants are now set or divided, and placed in new situations.

Cut box plant edgings, turn gravel, or put down fresh sweep-walks, and keep all in neat order.

Carry to a pit that is dug, bricked, or cemented, all litters and vegetable refuse, straws, and animal droppings, and sprinkle over the mass frequent balings of liquid matters, and soap suds from the house. Much valuable manure may thus be got from articles that are mostly lost.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR FEBRUARY.

The weather having been dry, when compared with many previous corresponding periods of the year, considerable progress has been made in ploughing and sowing in nearly all parts of the United Kingdom; indeed, we believe that, with a very few exceptions, out-door farm labours are now quite as forward as in the ordinary run of years. This is an important feature at this moment, because upon it, in a great measure, depends the productiveness of the forthcoming crop. We regret to find that, in almost every locality in England, the quality of last year's wheat is still proving very inferior. In point of fact, it would appear that not more than one-third of the entire growth is fit for millers' purposes, without a large admixture of foreign produce. It seems to follow, therefore, notwithstanding the enormous supplies of foreign grain and flour still on hand, and the prospect of *heavy* importations during the next four or five months, that good and fine wheats, both English and foreign, will command high currencies, certainly until the result of the next harvest is known. In some quarters the barley crop is turning out much better than was at one time anticipated; still, a large quantity of it grown for malting purposes has proved unfit for the malt-kiln. Considering the extent of the consumption in this country, it is clear that we shall be compelled to import barley extensively from our usual sources of supply. As regards oats, the yield is very deficient; but the produce of both beans and peas has proved somewhat large.

The metropolitan markets still continue to be heavily supplied with potatoes, coastwise and by land carriage, in, for the most part, good saleable condition. Our readers are aware that for several months we have contended that the produce of the potato crop last year, both in England and Scotland, was a large one, even after making due allowance for extensive losses by disease. To prove the accuracy of our views, we need only refer to the present state of our markets, and the continuous decline in the quotations, which now range from 60s. to 180s. per ton. The stocks still on hand in Scotland, and some of our midland counties, are represented as large; hence, consumption will be easily met for some time. The abundance of potatoes, however, can scarcely affect the future value of wheat. We may import largely, and corn bills may be looked upon with some suspicion by the bankers; but we believe that the wheat trade, as respects the value of good and fine samples, was never in a firmer position than it now is. The fact is that the leading importing houses will decline to force sales, knowing that the millers *must* purchase of them considerably more than ordinary supplies, and that they have little or no competition on the part of the English growers to contend against. With reference to spring corn, one thing is clear, viz., that prices must of necessity continue steady; still it is equally clear that the English cultivators are receiving a very poor return for the crops produced in 1860, arising from the wretched condition in which they were harvested.

The public sales of colonial wool, at which about 50,000 bales will be offered, have been commenced in London; but we apprehend that they will close in a most unsatisfactory manner. At the same period last year, under 30,000 bales were brought to the hammer, with money at 4 per cent. As the demand for wool in the manufacturing districts, arising from the almost entire absence of orders from America for woollen goods, has fallen off considerably, and as very few transactions have been reported for export to the continent, we must look forward to considerable heaviness in the trade for some time. Shearing has been partly commenced in some counties, and the growth of wool is proving quite equal to last year.

The cattle trade has continued in a healthy state, yet prices have shown rather less firmness. The inferior condi-

tion of last year's crops of hay and roots is very much against the production of live stock.

Rather a heavy fall, owing to large importations from abroad, has lately taken place in the value of hops, which are on show in very poor condition. Comparatively speaking, very few hops have come to hand from Germany; but from other parts of the Continent the supplies have been liberal. From New York the arrivals still continue very large, and, on the whole, of fair average quality. The present value of the best hops is £10 per cwt.

Increased supplies of both hay and straw having appeared on sale, the trade generally has fallen off, and prices have had a drooping tendency. Meadow hay is now selling at from £2 to £5 5s., clover £3 to £5 15s., and straw £1 10s. to £1 18s. per load.

The Scotch markets have been fairly supplied with wheat in somewhat prime condition, and all kinds have changed hands steadily, at full quotations. Barley and oats have continued in request, partly on English account; but other kinds of produce have commanded very little attention.

In Ireland no particular movement has been observed in the grain trade, and scarcely any change has taken place in the quotations. The export demand has not improved. Potatoes still continue to hold out extremely well.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that the various markets for consumption have been seasonably well supplied with each kind of stock, the cattle trade, generally, has continued in a healthy state; nevertheless, on the whole, prices have shown somewhat less firmness than in the previous month. It is very satisfactory to be enabled to state that the arrivals of beasts up to the Metropolitan Market have been in much better condition than for some time past, and that, consequently, they have commanded corresponding quotations. Our advices, both from Scotland and Norfolk, are of a favourable character as regards the condition of the stock on hand; hence, we may, therefore, look forward to good saleable arrivals during the next four months, unless, indeed, disease should become more prevalent than it now is. As regards sheep, a worse state of things has prevailed. At least, two-thirds of the supplies exhibited in London have been in very middling condition, whilst not a few of them have shown signs of foot-rot. Prime stock has therefore realized high quotations, say 5s. 8d. to 6s. in the wool, and 4s. 10d. to 5s. out of the wool, and which we think will be supported for some time.

Although money is very dear in the discount market, and although commerce is in a comparatively stagnant state, consumption of meat in the metropolis and elsewhere appears to be very large; so large, indeed, that the whole of our importations from abroad are readily cleared off at what we consider high quotations. Advices from Holland state that the numbers of beasts and sheep in course of fattening for the English markets are decidedly in excess of last year. The high rates at which most of the sheep have found buyers appear to have given a great stimulus to the production of stock in that country, from whence, no doubt, we shall import liberally during the remainder of the season. Dutch sheep now arriving in this country, and which continue to carry a large quantity of internal fat, thereby adding so much to their market value, are almost wholly composed of crosses with our best breeds, chiefly the black-faced. Indeed, it is remarkable with what rapidity the pure breeds of Holland have been changed into stock of a comparatively first-class quality. In reference to the German sheep, which still only command from 18s. to 21s. each, we may observe that not the slightest improvement has taken place in them; still they find buyers, chiefly for con-

sumption in poor localities, where they are dressed up and sold for lamb!

In our leading grazing districts the quality of last year's hay and root crops is still much complained of. There is a great abundance of both as to quantity, but the quality is far more inferior than during the last two years. Of course, the want of quality interferes very much with the exertions of the feeders in producing good saleable stock, and compels them to use more than the usual quantity of cake.

The following return shows the total numbers of stock exhibited and disposed of in the Metropolitan Cattle Market during the past month:—

					HEAD.
Beasts ..	..	..	..	..	18,760
Cows ..	..	..	..	..	500
Sheep ..	..	..	..	..	83,280
Calves ..	..	..	..	..	934
Pigs ..	..	..	..	..	2,080

COMPARISON OF SUPPLIES.

Feb.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1860.....	19,750	322	87,533	974	2,094
1859.....	17,694	499	79,691	1,034	2,557
1858.....	18,276	466	69,070	1,091	1,559
1857.....	17,629	457	74,430	1,172	1,975
1856.....	19,642	495	99,950	673	2,614
1855.....	17,436	385	91,180	596	2,705

The arrivals from Norfolk, Suffolk, Essex, and Cambridge-shire have comprised 9,800 Scots, shorthorns, and crosses; from the northern counties, 1,200 shorthorns; from other parts of England, 4,000 various breeds; and from Scotland, 590 Scots and crosses. No beasts have reached us from Ireland.

The importations into London from abroad have comprised the following:—

					HEAD.
Beasts ..	..	..	..	..	2,030
Sheep ..	..	..	..	..	5,582
Calves ..	..	..	..	..	846
Pigs ..	..	..	..	..	27
Total ..	..	..	..	..	8,485
Total in 1860 ..	..	..	..	..	7,018
1859 ..	..	..	..	..	7,809
1858 ..	..	..	..	..	2,320
1857 ..	..	..	..	..	4,720
1856 ..	..	..	..	..	3,087
1855 ..	..	..	..	..	2,839
1854 ..	..	..	..	..	10,683

Beef has sold at from 3s. 2d. to 5s., mutton 3s. 8d. to 6s., veal 4s. 6d. to 5s. 8d., and pork 4s. to 5s. per 8lbs. to sink the offal.

Seasonably good, but by no means heavy supplies of Scotch and country-killed meat have been received up to Newgate and Leadenhall. The demand has been somewhat inactive, at the annexed currencies. Beef from 2s. 10d. to 4s. 4d., mutton 3s. 4d. to 5s., veal 4s. to 4s. 8d., Pork 3s. 6d. to 4s. 10d. per 8lbs., by the carcass.

ISLE OF ELY.

The variable character of the weather still continues. One week we have mild and genial weather, prompting the belief that spring is near; and another, we have a return to cold and snow, reminding us that it is still winter. The cold seems reluctant to leave us, and we fear it may linger long into the spring. We have hitherto had but little thoroughly drying weather. The mild and spring-like days have not been searching and bracing, but generally have been damp, with a moist, heavy atmosphere. The high lands will scarcely work well yet: they are well pulverized by the frost, but require to be a little drier on the surface before the horses go upon them. The growing wheats are only moderate in many instances. On clover leys, and on wet, high lands generally, the plant is very thin and sickly. The slugs have eaten the former, and the water has decayed the seed in the latter. On all these lands, the prospect is anything but flattering. Upon the fen soils the plant, too, is greatly injured, and promises badly. These lands were very wet when the severe frost set

in, which made them more susceptible of influence by the frost. The consequence was, the action of the frost was so great, that it raised these lands so suddenly and so considerably that the stem of the wheat was broken—completely snapped asunder—through the lifting up of the land; and the plant is very seriously thinned, and in some instances will require re-sowing. Our Fen prospects are, therefore, anything but encouraging, and our Fen farmers are beginning to despair. They have already had three decidedly bad harvests in succession, and are now threatened with a fourth; but we trust their fears, in this instance, may not be realized. It is premature to judge of a wheat crop yet; but still, where the plant is largely lost, it requires strong faith to anticipate an abundant harvest. Horses now find full employment in preparing the land for the reception of the spring seed. Beans are already being planted, and many are being sown over the plough-beam. With a few fine days, oat-sowing will be commenced; most of the land designed for this crop is already ploughed, or will be in a very few days. Keeping is tolerably plentiful. Mangolds hold out very well, and, with an average spring for grass, will last through. Store cattle are dearer, with a brisk trade. Sheep are scarcely as high as they were. They made a rapid advance a few weeks, since which they have hardly maintained. The corn trade is as languid and depressed as it can be. It is a misnomer to call it a trade. Nobody cares to buy our low Fen qualities; and where sales are effected, prices are invariably bad. Better condition might improve the demand, probably; but in this respect, "Hope long deferred makes the heart sick."—YOUR FEN REPORTER.—Feb. 19.

NOTTINGHAMSHIRE.

We are gradually passing through another trying winter, having to contend with the want of food and quality of such for stock. The hay-stacks are found very defective, and every expedient the mind can conceive is made use of, to make the whole available as food. Steaming of it stands first of the contrivances, hot water is brought to help where the steaming-apparatus is wanting, and mixture with better food where the trouble of both is avoided. The fact is, that these are the seasons when out of the evil comes forth good, for many of the modes of economy now practised will not soon become obsolete. The turnips and mangold crops are found deficient, and pulped roots with cut hay and straw is the method pursued by our leading ones for the lengthening out of winter provision. How is it that a practice so easy and sensible has not been before now universal? Straw in many districts is far from being plentiful, arising from the want of bulk grown, and the scarcity is increased from a less amount of thrashing being done. Our pasture fields look fresh and green, and what little tillage fog we have is appreciated by the owner. The wheat crop has improved on all dry soils, while on cold clay lands it seems doubtful, and too weak to hazard an opinion on it. A limited breadth was sown in the autumn and early winter, but a more than usual quantity has been put in during the last fortnight, and no doubt will be for a week or two to come, should the weather be favourable. Farming work is in a very backward state, little autumn clearing was done, and farmers will now be more than usually engaged in getting up the arrears. Our cattle markets are quiet, with very little change. Some very lean stock is shown, and such very little wanted; fat stock keeps up, and should the consumers be in a position to buy, must, one would think, advance in value. Our corn markets are strange affairs, strange we say, because of the many varieties offered: wheat from 36s. to 80s. per qr.; who, under such circumstances dare quote prices? The last year's crop is woefully bad in quality and quantity. One farmer offered the wheat of his farm, the whole of it, for six bushels per acre, value about 1s. per stone of 14lbs. Never since 1816 do we remember anything so bad and universally so. Barley coarse, except in a few favoured districts. Oats want colour. Beans soft and wanting the kiln to make them useable. Nottingham, Mansfield, and Newark markets, famed for the good show of corn, is out sadly, and a fine sample is more the exception than the rule; the consequence is, many farmers find themselves wanting money, while the foreigner walks off with the cash. The labour market is affected, and the labourer has more trouble to get employment. Let us hope on.—Feb. 18.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ABINGDON FAIR.—It is not much of a mart for sheep or tegs, and the few shown soon changed hands at 3s. to 5s. per head in advance of what could have been obtained at our December fair. A good number of cows, if down for milk or with calf at foot, realized very full rates, as also did all descriptions of barreners or heifers in-calf, if at all in good condition, with a quick sale. In the horse fair there was a splendid show of good cart colts; for three-year-olds prices ranged from £35 to £40. There were some magnificent strings of working horses for London and the hill country work. They came pouring in all day Friday and Saturday, and as soon as offered were bought up eagerly at prices very remunerative to the agriculturist.

BANBURY FAIR.—Neither in the beast nor sheep market were supplies above the average, and trade was rather dull. Prices ranged for beef from 4s. to 5s., and mutton 5s. to 6s. per 8lbs.

BERWICK FORTNIGHTLY MARKET.—There were a great many buyers present from the south, but the show of fat cattle was very small. There were two cows sold for £45. Mr. Black, Norham Mains, sold a lot at £23 7s. 6d. each. Prime Beasts brought 8s. per stone, inferior 7s. 6d. Good Wedders were sold at 8½d. to 8¾d. per lb., and all sold. There were a few inferior Ewes in the market, for which the owners were asking 7d. per lb., but these were not sold. Fat Pigs sold at from 6s. to 7d. per stone.

BEVERLEY FAIR.—There was a very limited supply of first-class horses, which were readily sold. There was a very large show of scarcely second-class horses, but sales were heavily effected; and the show of inferior animals, as usual, was large. In the cattle fair there was a short supply, nearly the whole of which were readily sold.

BRIDGNORTH FAIR.—There was a good attendance, and fair show of cattle. Good beasts realized from 6½d. to 7d. per lb. The supply of sheep scanty, not equal to the demand, and sold well, best wethers fetching fully 9d., and ewes 8½d. per lb. Cows and calves from £12 to £18, and a fair supply. In the horse fair a good show of agricultural animals, but good hacks very scarce; the former went from £25 to £30 each, the latter at all prices from £10 to £20.

BROUGH FAIR.—Good present calving cows much looked after, and sold from £12 to £16, and ranged from thence to £19 10s. and £20 per head. Fresh geld and other beasts sold well.

CARLISLE HORSE FAIR.—There was a large show of draught horses, which being in fair average condition brought good prices. The number of saddle horses was exceedingly limited, and two or three only were sold at the close of the market. Ponies were a fair average show, and commanded the prices obtained last year. The attendance of buyers was good, and although the demand was very slow at the commencement, yet towards the end of the market a good business was done, principally by jobbers, at prices slightly below those of last year. Prices may be quoted as follows: Good cart horses from £20 to £36, inferior do. £15 to £20, cart colts and fillies £15 to £23, ponies £7 10s. to £16.

CHARLES FAIR, STRATHDON.—There was a pretty good out-turn of cattle, but not so many as the dealers present would have done business with. Mr. Douglas, Buchaam, Strathdon, sold 3 stots at £16 a-head; the Rev. Mr. Watt, Strathdon, sold a stot at £24; Mr. Ironside sold a stot at £18; Mr. McGregor, Torrinbunie, sold two stots for £40, and two queys for £21; Mr. Strachan, Mill of Fowlis, bought two queys for £26 10s.; Mr. Kennedy, Delrossach, sold two queys for £26 10s. The demand was good, and the prices considerably in advance of what they were at the same market last year.

CHERTSEY FAIR.—The supply of stock was large, but chiefly consisted of young cattle, and among which there was but a dull demand, good milch cows and dairying stock commanded a moderate sale. Cows, in full milk, and with a calf by their side, made £14 to £17; small and plain-bred dairying stock, £11 to £13; Alderney milch cows, £12 to £16; cows, down calving, £9 to £11; and aged cows, in calf, £6 to £9;

steers and heifers, the former straw-yard feeding, sold at £7 to £10; ditto heifers, £6 to £8; well-bred stock heifers £8 to £10; yearlings, £4; and calves, 14s. to 23s. each; beasts, fresh and well up in condition, made £17 to £22; bulls, £9 to £14. Sound useful cart-horses, for farming work, made 16 to 22 guineas; light-made active horses, for vans and single-harness purposes, realized figures varying from 24 to 32 guineas. There was a good supply of pigs, and trade was good; strong and large stores made 35s. to 45s. each; small pigs, 17s. to 24s.; and well-fed large hogs, £5 to £7.

DORCHESTER FAIR.—There was a large supply, principally of lean stock, and fat beasts were much inquired after, while altogether there was a ready sale for anything worth purchasing. Inferior barreners ranged from £6 10s. to £10, while those in better condition made from the last-named sum up to as much as £17 for anything very fresh. There were two very fine shorthorn bulls in the field, one of which sold for £43, and £50 was asked for the other, but we did not hear that it found a purchaser.

DUMFRIES PORK MARKET.—The attendance of buyers was not large, and the demand was consequently somewhat slow. The number of carcasses was 370, rather less than last week. In the early part of the morning the current rates for prime carcasses of medium size were 7s. 4d. to 7s. 5d. per imp. st.; and as the day advanced the prices fell slightly. Prices for secondary carcasses, 7s. 1d. to 7s. 3d. per imp. st., and heavy carcasses 6s. 8d. upwards.

ELGIN MONTHLY MARKET.—The attendance was very large, the demand for fat stock very brisk, and a heavy amount of business transacted. Mr. Hardie, Calcots, sold 2 stots at £60 the pair; Captain Young, Main, a lot of stots at £25 a-head, and a bull at £26 10s.; Mr. Cruickshank, Barmuckity, a lot of three-year-old queys at £17 a-head; Mr. Adams, Sweethillock, a pair of queys at £18 a-head; Mr. Squire, Muirhead, Alves, a mixed lot at £17 a-head; Dr. Ross, Linkfield, a lot of crosses at £19 a-head.

GLOUCESTER MONTHLY MARKET.—There was a good supply of beef and mutton, with an active demand, but very little alteration in prices. Beef sold readily at 7d., and mutton from 8d. to 9d. per lb.; pigs from 10s. to 10s. 6d. per score. At these rates a good business was done, and an entire clearance effected.

ILSLEY FORTNIGHTLY SHEEP MARKET.—The supply was good, and a ready sale effected at full prices. There was a good attendance of dealers.

MORETON-IN-MARSH FAIR.—The supply of beef and mutton far exceeded that at any previous February fair, and the demand was fully equal to the supply. More inquiry was made for store and milk cattle, and higher prices realized. Beef made 7d. to 7½d., and mutton 7½d. to 8½d. per lb.

NORTHAMPTON FAIR was scantily supplied with beasts, principally stores, for which a slight reduction took place. There were scarcely any fat beasts exhibited. There was a moderate supply of sheep, the demand for which being somewhat dull. Best wethers made from 5s. 6d. to 6s., ewes from 5s. to 5s. 4d. per 8 lbs. There was also a good show of horses, with a fair inquiry.

PENRITH HORSE FAIR.—There was only a small show, and of these very few were of good quality. There was a tolerable number of buyers, but very few appeared to mean business. Only a small number of sales were effected. Good cart horses from £18 to £30; inferior £15 to £18; colts and fillies £12 to £20; ponies £7 to £14.

TEWKESBURY FAIR was unusually large for the season. Fat meat was abundant, and fetched good prices; mutton out of the wool, 7d. to 7½d.; beef, 7d.

WINCHESTER FAIR was well attended, though the business done was rather limited. There was a good supply of cart-horses, and they sold well. In neat cattle there was a short show, and good prices were realized. Pigs were offered in large numbers, still full prices were maintained.

WINSLOW MONTHLY MARKET.—We were rather scantily supplied with mutton, which realized 5s. to 5s. 6d. per stone. For bacon hogs and porkets there was a good

trade, at 11s. to 12s. per score. London cows, £12 to £25; down-calving ditto, £12 to £22; barrens, £10 to £20 each. Storks, £9 to £18 per pair.

WORCESTER FAIR.—There was a good attendance of buyers. We were well supplied with fat cows, which were all sold at 7d. to 7½d. per lb. There was a short supply of sheep, which were in great demand, and fetched extravagant prices. Fat calves were also in demand, and realized full 8d. per lb. There were very few cows and calves on offer, and those of an inferior description. Good supply of fat pigs, which were all sold, fetching 11s. per score.

IRISH FAIRS.—**GRAIGUE:** There was a good supply of fat beasts, but the demand far exceeded the supply, and consequently first quality beef brought from 60s. to 70s per cwt.; second quality from 50s. to 52s. 6d. Fat sheep were also in brisk demand, with rather scanty supply. Prime wether mutton realized about 8d. per lb.; ewe was about 1d. per lb. cheaper. There was a good supply of hogs, which were sold at from 30s. to 35s. each. Springers were much sought after, but the supply was limited; they sold freely at from £14 to £18 each. Milch cows were also scarce, and rated high. Three-year-old heifers were very brisk demand, they rated from £10 to £12 each. Yearling heifers sold at from £5 10s. to £7 each. There was a large supply of

fat pigs at the fair which was held on Saturday. Buyers were numerous, and the demand was brisk for porkers, which sold at from 54s. to 56s. per cwt. Heavy bacon pigs and small descriptions were not much inquired after, but good stores sold freely at from 50s. to 60s. each. At **TAGHMON** store cattle appeared in rather backward condition, but the better kinds were in brisk demand. Two-year-old heifers and bullocks brought £6 to £8, three-year-olds £7 to £10 each. Springers were likewise in request. **SLANE:** The demand for beef appeared undiminished, and late rates were fully maintained for top lots, selling as they did from 60s. to 63s. per cwt. Inferior beef was purchased at about 50s. per cwt. The exhibition of store or dry cattle was all that could be desired, but the transactions were slow. The highest price for three-year-olds was £13 5s., and they retrograded, according to quality, to £11 each; two-year-olds £8 to £9, yearling heifers £3 5s. to £5 15s., and a few lots at a shade beyond the latter figure. Springers in good condition brought remunerative rates, yet a marked decline in price was observable in everything in the dairy line. In swine a very active trade was carried on for exportation. Bacon declined in price slightly. The quotations were about 53s. to 54s. per cwt. Store pigs dull of sale.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

February on the whole has been more favourable to field work than usual. The first fortnight was very fine; then came alternations of frost and thaw; and finally, after some severe storms, there was a return to open weather. The last week of January being fine, there were full three weeks without rain: this permitted a gradual drainage of the previously frost-bound soil, and gave a fine opportunity to plant the unsown wheat, but there yet probably remains one-fourth part still to plant. The early-sown pieces have generally borne the frost well, and a general growth has commenced; but the later fields show but a weak plant, and much is reported to have rotted. This we attribute principally to the unripe character of the crop last year; and as in horticulture this year the seed preferred is that of 1859, so we think it would have been well if farmers had adopted the same plan; for much of the new is said not to germinate, or to go through the process weakly, and so leave but a feeble plant to contend with the ever variable character of a British spring-time, and endanger the ultimate yield. The elaborate and carefully prepared statistics that appeared in the *Mark-Lane Express* on the 18th ult., fully confirmed the previously bad reports of the crop of 1860, and have served as a basis whereon to calculate the quantity of land yet unsown. And certainly the most sanguine view of the future, should the remainder go in well, and a fine spring and summer follow, could scarcely estimate the next gathering beyond an average. We are, therefore, taught very impressively our dependence on the bounty of the Supreme Power for our national well-being. But as the average of seasons has hitherto been sufficient for the wants of the world, and last year was exceptional, let us not give way to misgivings or distrust. Foreign supplies have poured upon us with unusual abundance: America by its fine crop

has made up for our short-comings, and the new produce of Southern Russia is unusually fine, and though much pressure has been felt by the agricultural interest, the nation has much cause for thankfulness and contentment. The past month has been very dull throughout. The general averages only show a decline of from 56s. 7d. to 54s. 9d., or 1s. 10d. per qr., but the scarcity of fine English samples has been such that their value has been little if at all altered. But to show how unreliable the averages are this year, in consequence of the immense difference in the samples, we instance the London averages, as commencing in February at 60s., and falling to 52s. 6d., which, if they indicated the real difference in the markets, would show a decline of 7s. 6d. per qr. But this season, from the difference in dampness and quality, one week's supply will sometimes be 3s. above or below another in value.

The high rate of discount, at a time when large foreign imports are quite a necessity, has had a depressing influence on business, and the probable early opening of the Baltic has kept millers quite on the reserve; but if the weather should be unfavourable, or the threatening aspect of Europe break out into actual hostilities, there must be a rise in prices, the deficiency of last year being probably one-third, or six million quarters. The following quotations were recently quoted at the several localities named: the best wheat at Paris was about 59s. per qr., at Louvain 63 lbs. red 58s., new native at Amsterdam 56s. to 62s. 6d., Danzig to 71s. 6d. At Hambro', 60 lbs. Mecklenburg was 61s., Marks 61 lbs. 60s. 6d., Holstein 57s. At Zurich the average was 60s. Pomeranian at Stettin 57s., red Stettin 56s. Cologne quoted 55s. per qr.; red kilndried at Groningen 53s., white 55s. Courish at Riga 52s. 8d. Odessa quotations were 46s. 9d. for Polish Odessa, 50s. 6d. for Sando-

mirka. At Algiers soft wheat was as high as 60s. 6d. per qr. : white at Santander 59s., red at Leghorn 56s. 6d., white 63s. ; white wheat at Toronto to 56s. 8d., white Michigan 50s., Kentucky 56s., red Winter 44s. 4d.

The first Monday in London opened after a considerable supply of foreign wheat, though of home growth there was but a moderate quantity. The morning's contributions from Kent and Essex were very small, and in the usual damp state. The few dry parcels that could be selected were readily placed at fully the previous quotations, the others being left unsold. Notwithstanding the heavy foreign supply, of which 21,000 qrs. were American, the foreign trade ruled firm for all fine qualities, cargoes off the coast finding a free sale. The country markets were mostly like that of London ; but several places, as Hull, Ipswich, Lynn, Sleaford, and Newark were up 1s. per qr., Bury St. Edmonds making the rise 1s. to 2s. per qr. ; but Birmingham, Bristol, and Gloucester were rather in favour of buyers. Liverpool on Tuesday advanced 2s. per cental on American wheat, and was firm on Friday.

On the second Monday the foreign arrivals were still heavier, those from America alone being 24,000 qrs., but the English supplies were small. There were again but few samples sent up from the near counties during the morning, and those in much the same condition. Good English wheat was still saleable at unaltered rates, inferior being neglected. There being a good attendance, holders of foreign found no necessity to give way in price ; but this firmness checked the sale, even on fine qualities, say 1s. to 2s. Cargoes off the coast sold at improved rates. During the week the country markets varied so little as to be unworthy of notice. Liverpool was firm on Tuesday, but rather gave way on Friday, say 1d. to 2d. per cental.

On the third Monday there was a great falling off in the foreign supply—it being only one-fifth of the previous week. In English qualities the quantities also were small. Beyond this, the show of samples from Essex and Kent was quite trifling ; yet this was the dulllest Monday of the three, and good parcels were not so readily taken : inferior being altogether without offer. The increased rate of discount, as well as the mild weather, influenced the foreign trade, which hardly commanded former prices : some sales being made under the then quoted prices, and cargoes off the coast were placed with difficulty, though not numerous. The country markets this week were again very much in unison : Hull and Birmingham were rather lower ; Norwich and Newcastle, with some other places, declined 1s. per qr. ; but a few markets, as Gainsborough, were rather higher for really dry wheat, from its scarcity. Most reports were unaltered as to the value of good wheat. Liverpool, on Tuesday, was 1d. to 2d. per cental cheaper for inferior American : Friday exhibiting a small further decline generally.

The fourth Monday was well supplied with foreign, but chiefly of the lower qualities—some even from the East Indies ; though the receipts of home-growth were moderate. Scarcely any good

samples were sent up during the morning from the near counties, and very little altogether ; the bulk apparently still more deteriorated in condition by the damp weather which for a week has prevailed. Fine samples sold readily at former prices ; the rest were neglected, and scarcely saleable. Fine foreign Danzig and Rostock were fully as dear ; but low Russian and Danubian, though there was a good attendance, were not at all in request, and could not have been forced off without a sacrifice. Good American was unchanged.

The imports into London for the four weeks were 14,723 qrs. English wheat, 134,363 qrs. foreign, against 27,070 qrs. English, 2,387 qrs. foreign in 1860. The imports in January last were 516,642 qrs. wheat and 779,489 cwt. flour.

The flour trade during the month has little changed ; Norfolks commenced at 40s., and closed nominally at 39s., with a very slow demand, in consequence of the too free use of inferior English wheat. American barrels also, from the free importation, have declined in value 1s. per brl., but throughout, in consequence of their good quality, have found a fair sale, prices varying from 29s. to 33s. for extra, and even more for picked qualities. Town millers have not been, however, able to lower their top price, which has stood at 57s., in consequence of the high rates paid for fine old foreign wheat, samples of extra high-mixed Danzig being sold at 75s. The imports into London for the four weeks were in country sorts 58,295 sacks, in foreign 3,384 sacks 71,279 brls.—against 76,572 sacks English, 650 sacks 3,526 brls. foreign in 1860.

Barley during the month has declined in value about 2s. The sales all through have been very difficult, except at the commencement for fine malting sorts ; these eventually, in consequence of the unsatisfactory state of the malt trade, participated in the general decline, rates having long ruled very high. As the season advances, and imports of foreign increase, we expect some further reduction ; but should oats keep their value, the grinding sorts are not likely to be much reduced, as they will serve for mixing, being relatively cheaper. The imports into London for the month were 20,311 qrs. English, 46,012 qrs. foreign—against 36,013 qrs. English, 24,058 qrs. foreign in 1860. The imports in January for the kingdom were 79,720 qrs.

Malt all through the month was very dull, and sales generally made at 1s. per qr. less money ; the free use of sugar in brewing is said to have greatly lessened the demand.

The oat trade has been dull, without quotable change, the English supplies per rail being about equal to all the rest, the market being thus supplied with a cheaper quality than the fine. Foreign held in granary has been unvaried. The high rates ruling seem to have determined dealers to wait till arrivals become free from the Baltic ; and as the mild weather has already allowed some imports from Holland, the Danish isles, and Sweden, it is expected there will be sufficient till the heavy Russian shipments are made. As oats this year have

turned out the best crop, we may probably see some decline in prices. The imports into London for the four weeks were 31,117 qrs. English, 1,139 qrs. Scotch, 7,493 qrs. Irish, and 23,915 qrs. foreign—against 17,850 qrs. English, 14,137 qrs. Scotch, 8,330 qrs. Irish, and 24,790 qrs. foreign in 1860. The January imports for the kingdom were only 37,430 qrs.

With fair foreign imports and a liberal supply of Egyptian lentils, beans have closed dull, though no difference of value has been noted. The inferiority of the oats used must, however, lead to a large consumption for horse food, and we do not see much prospect of a serious decline in this grain. Prices, however, are rather easier at Alexandria, and should receipts there become free they may be lower here. Imports for the four weeks into London were 4,472 qrs. English, 12,353 qrs. foreign: against 5,708 qrs. English, 704 qrs. foreign in 1860. The importation for the kingdom last January was 79,720 qrs.

Though the supplies of peas for the month have been small, the markets have been heavy. A seed demand for a time kept up the high prices of maples, but for consumption the demand has been only limited, and the inferior quality of duns has made them difficult to place. White boilers though comparatively moderate have been less in demand, the return of mild weather giving them little chance of a rally now that the season is advancing. It is, however, extraordinary that the failure of potatoes and greens should not have drawn public attention to this relatively cheaper food. The lower qualities of white are more readily quitted for horse food, being as cheap as beans. The arrivals for four weeks into London were 1,804 qrs. English, and 1,843 qrs. foreign: against 2,217 qrs. English, 978 qrs. foreign in 1860. The imports for January were 40,783 qrs. for all the kingdom.

The linseed trade has rather given way under the pressure of the previous month's supplies, though prices were then supported. The decline was 2s. to 3s. per qr. on the first Monday; but, as arrivals somewhat fell off, a firmness was resumed towards the close of February. The receipts for February this year were 29,440 qrs., against 13,076 in 1860.

The seed trade, contrary to all expectation, has continued in abeyance. Though the season of 1860 made a good crop impossible, some arrivals from America have led buyers to infer that foreign receipts will be quite sufficient for the usual demand; and the very unsatisfactory character of the trade last season, when prices for consumption were only at low speculative rates, seems to have kept all parties on the reserve. There were symptoms of a demand, however, till the rain of the last week, and holders of fine red and white foreign cloverseed have remained firm. Trefoil, too, has been steady. Large tares have been much inquired for, and as much as 64s. per qr. has been paid; but small have been offering as low as 46s. per qr. without ready sale. Canaryseed has ruled excessively dull, the quality being unfit to keep. Other seeds much as last quoted.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.
WHEAT, Essex and Kent, white, new 40 to 63 fine old 65 to 72	
" red 38 59 " 64 72	
Norfolk, Linc., and Yorks., red 38 58 " 63 69	
BARLEY, malting 31 to 39 Chevalier, new 34 46	
Grinding 30 31 Distilling 32 35	
MALT, Essex, Norfolk, and Suffolk 53 to 60 fine 66 77	
Kingston, Ware, and town made 54 62 " 65 77	
Brown 56 59	
RYE, seed new 32 37	
OATS, English, feed. 21 to 26 Potato 27 34	
Scotch, feed 24 28 Potato 28 34	
Irish, feed, white 20 to 25 fine 25 28	
Ditto, black 20 25 " 27	
BEANS, Mazagan 31 to 43 Ticks 31 41	
Harrow 33 47 Pigeon 44 50	
PEAS, new, white, boilers 40 47 Maple 44 to 48 Grey 37 41	
FLOUR, per sack of 280 lb., Town, Households 51 57	
Country 38 to 40 Households 40 49	
Norfolk and Suffolk, ex-ship. 38 39	

FOREIGN GRAIN.

	Shillings per Quarter.
WHEAT, Dantzic, mixed 65 to — high do. — to 66 extra — to 72	
Königsberg 54 64 — — — 71	
Rostock 65 — fine 69 — 72	
American, red 60 63 white. 61 66	
Pomera., Meckbg., & Uckermark, red 60 61	
Silesian, red. 60 63 white. 62 68	
Danish and Holstein 60 65	
Russian, hard 54 to 56 French 58 to 62 white 62 65	
St. Petersburg and Riga. 56 61	
Rhine and Belgium 60 66	
BARLEY, grinding 28 to 29 Distilling 31 34	
OATS, Dutch, brew, & Polands 24 32 Feed 22 28	
Danish and Swedish, feed. 24 28 Stralsund 24 29	
Russian 25 28	
BEANS, Friesland and Holstein 36 44	
Königsberg 39 to 46 Egyptian 37 38	
PEAS, feeding 40 45 fine boilers 42 46	
INDIAN CORN, white 38 41 yellow 39 42	
FLOUR, per sack French 41 47 Spanish p.s.k. 46 48	
American, per, brl. 28 30 extra & dbl. 31 33	

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Jan. 12, 1861 ...	57 1	40 6	22 6	34 6	43 10	44 6
Jan. 19, 1861 ...	57 3	40 6	23 2	34 9	41 10	43 0
Jan. 26, 1861 ...	56 7	40 7	23 1	35 10	42 5	41 8
Feb. 2, 1861 ...	55 6	40 0	23 3	34 8	40 4	43 0
Feb. 9, 1861 ...	54 0	39 8	22 6	36 3	39 10	42 7
Feb. 16, 1861 ...	54 9	38 11	23 0	35 7	40 0	44 7
Aggregate Average	55 10	40 0	22 11	35 2	41 5	43 3
Same time last year	43 9	34 8	21 5	31 4	38 5	36 1

COMPARATIVE AVERAGES—1861-60.

From last Friday's Gaz.	s. d.	From Gazette of 1860.	s. d.
Wheat 63538 qrs.	54 9	Wheat 117309 qrs.	43 11
Barley 64688	38 11	Barley 71544	34 11
Oats 16694	23 0	Oats 17985	21 11
Rye 99	35 7	Rye 55	31 0
Beans 3747	40 0	Beans 7230	38 6
Peas 979	44 7	Peas 1581	36 3

PRICES OF SEEDS.

LONDON, Monday, Feb. 25.—The heavy rains and rough weather of the past week have much interfered with the demand for seeds of all descriptions, and to-day there was but a limited trade passing, without alteration in value. Prime samples of all varieties are most inquired for, with but few offering.

CUTLER AND BARKER, Seed Factors.

BRITISH SEEDS.

MUSTARDSEED, per bush., brown. 11s. to 15s.	
CORIANDEE, per cwt. 14s. 16s.	
CANARY, per qr. 50s. 58s.	
TREFOIL 24s. 30s.	
TARES, winter, new, per bushel 10s. —s.	
LINSEED, per qr., sowing —s. to 74s. crushing. 58s. to 60s.	
LINSEED CAKES, per ton. £9 10s. to £10 10s.	
RAPESEED, per qr. 70s. to 76s.	
RAPE CAKE, per ton. £5 10s. to £6 0s.	

FOREIGN SEEDS, &c.

CLOVERSEED, red 46s. to 64s. white 72s. to 90s.	
TREFOIL 18s. 28s.	
HEMPSEED, small, —s. per qr. Dutch —s. 48s.	
CORIANDEE, per cwt. 16s. 18s.	
CARAWAY 32s. —s.	
LINSEED, per qr., Baltic 50s. to 52s. Bombay 52s. 56s.	
LINSEED CAKE, per ton. £9 10s. to £11 0s.	
RAPESEED, Dutch. —s. to —s.	
RAPE CAKE, per ton. £5 0s. to £6 0s.	

HOP MARKET.

BOROUGH, MONDAY, Feb. 25.—Our market continues exceedingly heavy, with scarcely anything doing in any description. Our quotations remain nominally the same.

Mid and East Kents.....	80s., 140s., 200s.
Weald of Kents	60s., 120s., 180s.
Sussex	60s., 90s., 140s.
Yearlings	80s., 126s., 190s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, Feb. 25.—During the past week the arrivals, both coastwise and by rail, have been moderate, but the quantity on hand and in store is considerable. Trade remains dull, and prices have undergone little alteration. The following are this day's quotations:—

Yorkshire Flukes	150s. to 160s. per ton.
Lincolnshire Regents	110s. to 120s. "
Dunbar red soil do.	150s. to 160s. "
North Berwick do.	120s. to 125s. "
Perth, Forfar, and Fife do.	95s. to 105s. "
Ditto, do. do. Reds and Rocks ..	85s. to 100s. "
French Whites	60s. to 90s. "
Belgian do.	60s. to 80s. "
Dutch do.	60s. to 80s. "

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Feb. 25.—We continue to be heavily supplied with Potatoes coastwise and by railway. All kinds are consequently dull in sale, on rather lower terms.

	Per Ton.
York Flukes.....	120s. to 160s.
Scotch Regents.....	100s. to 120s.
Ditto Cups	100s. to 110s.
Ditto Rocks	95s. to 105s.
Dunbar Regents	160s. to 180s.
Other kinds	60s. to 95s.

COUNTRY POTATO MARKETS.—YORK, Feb. 16:

Potatoes 12d. per sack, and 3s. 6d. to 3s. 9d. per bushel. PICKERING, Feb. 18: Potatoes are very scarce, and prices tend upwards. Flukes 5s. to 5s. 6d, white roughs 4s. to 5s., reds 4s. to 4s. 6d. per bushel. MALTON, Feb. 16: Potatoes are firm, at 4s. per bushel, ash-tops, for spring, 2s. to 2s. 6d. per peck. LEYBURN, Feb. 15: Potatoes 3s. 6d. to 4s. per bushel. KNARESBORO', Feb. 20: Potatoes 1s. 1d. to 1s. 3d. per 21lbs. SELBY, Feb. 18: Potatoes 9d. to 9½d. per stone. LEEDS, Feb. 19: Potatoes 1s. to 1½d. wholesale, and 1s. 2d. to 1s. 4d. retail per 21 lbs. RICHMOND, Feb. 16: Potatoes 4s. 2d. per bushel. SHEFFIELD, Feb. 19: Potatoes sell at from 9s. to 15s. per 18 stones. MANCHESTER, Feb. 19: Potatoes 9s. to 15s. per 252 lbs.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Feb. 25.—The high price of fine Butter keeps our market in a dull state. Of inferior quality there is a large quantity pressing upon the market, which is almost unsaleable. As yet, there is so small a quantity of new-milk Dorset Butter showing here, that we cannot give quotations for price.

Dorset, middling..... nominal.

Fresh Butter..... 14s. to 17s. per doz.

BELFAST, (Thursday last).—Butter: Shipping price, 100s to 120s. per cwt.; firkins and crocks, 12d. to 12½d. per lb.; Bacon 62s. to 63s., Hams, prime 78s. to 82s., second quality 60s. to 66s. per cwt.; prime mess Pork 92s. 6d. per barrel; Beef, 120s. to 130s. per tierce; uncured Pork, 55s. to 60s. per 120lbs.

GLASGOW.—A small supply of Cheese, and the trade remains still very inactive. About four tons passed the weigh-house scales, and four carts in the Bazaar. To make sales, lower prices had to be taken, but we quote former prices. Early made 59s. to 63s., late and secondary 52s. to 58s., skim milk 27s. to 29s. per cwt.

GLOUCESTER FAIR.—About 80 tons were pitched, but the attendance of buyers was small, and the trade quiet, at the following rates: Best single 58s. to 60s., second ditto 46s. to 58s., skim ditto 25s. to 32s. per cwt.

SALISBURY MONTHLY MARKET.—Over 200 tons were pitched, and there was a dull sale at late prices. Half Cowsards 56s. to 60s., Doubles 60s. to 64s., best Somersets 66s. to 72s., Cheddars 74s. to 78s.

WOOL MARKETS.

ENGLISH WOOL MARKET.

Per sack of 240 lbs.

Fleeces—Southdown Hogs	£19 0 to £19 10
Do. Half-bred Hogs	20 0 20 10
Do. Kent	19 0 19 10
Do. Southdown Ewes & Wethers 17 0 18 0	
Do. Leicester do.	17 10 18 0
Sorts—Clothing, picklock	20 0 20 10
Do. Prime and picklock	18 10 19 0
Do. Choice	17 0 18 0
Do. Super	15 0 16 0
Do. Combining—Wethermatching ..	20 0 20 10
Do. Picklock	18 0 18 10
Do. Common	16 0 16 10
Do. Hog-matching	23 0 23 10
Do. Picklock matching	18 10 19 0
Do. Super do.	16 0 16 10

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS, Feb. 22.—The same characteristics of the English wool-trade, and also of the foreign, continue as they have been for many weeks. Prices are not materially altered, and the demand is only to meet the want of manufacturers, and these often arising from a desire to keep the machinery running, rather than a positive demand for goods.

LIVERPOOL WOOL MARKET, FEB. 23.

	s.	d.	s.	d.
Laid Highland Wool per 24lbs.	11	6	13	0
White Highland do.	13	9	17	0
Laid Crossed do., unwashed	14	6	16	6
Do. do., washed	16	0	18	6
Laid Cheviot do., unwashed	18	0	22	0
Do. do., washed	22	0	23	0
White Cheviot do., washed	34	0	42	0

FOREIGN AND COLONIAL WOOL MARKET.

	Per lb.	s.	d.	s.	d.
German, { 1st and and Elect.....	3	4	to	4	6
Saxon, { Prima	2	4	3	0	
and, { Secunda	2	0	2	4	
Prussian, { Tertia	1	8	1	10	
COLONIAL:—SYDNEY—Lambs	1	3½	2	3½	
Scoured do.	1	5½	3	2	
Unwashed	0	10½	1	2	
Locks and Pieces	0	10½	1	9	
Slips and Skin	1	0	1	9½	
PORT PHILIP—Lambs	1	3	2	8	
Scoured do.	1	3	3	3	
Unwashed	0	10	1	4	
Locks and Pieces	0	7½	1	10½	
S. AUSTRALIAN—Lambs	1	7½	2	1	
Scoured do.	1	4	2	6½	
Unwashed	0	9½	1	2½	
Locks and Pieces	1	12	0	0	
V. D. LAND—Lambs	1	5½	2	3	
Scoured do.	1	1½	1	10½	
Unwashed	1	0	1	7	
Locks and Pieces	1	1	1	8½	
CAPE OF GOOD HOPE—Fleeces	0	8½	2	0½	
Lambs	0	11½	2	1	
Scoured	1	0½	2	2	
Unwashed	0	8	1	6	

MANURES.

LONDON, FEB. 23.—Guano and Nitrate of Soda are in increased demand; the trade in the former is exceedingly brisk; there have been no imports of either this week. Cakes remain at last prices, with scarcely any variation; the supply this week from abroad has been limited to a few tons.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from importers' stores, £12 5s. to £12 15s. p. ton. Bones, £5 to £5 10s. per ton; ditto crushed, £6 5s. do.; ditto dissolved, £6 10s. do.; ditto half-inch 19s. to 19s. 6d. per qr.; ditto dust, 19s. to 20s. Animal Charcoal, (70 per cent. phosphate) £4 10s. to £5 per ton. Coprolite, Cambridge, in London, whole 12s. to 44s., ground 54s. to 58s.; Suffolk, whole 38s., ground 46s. to 4 s. per ton. Nitrate of Soda, £13 10s. to £14 10s. Gypsum, 30s. per ton. Salt in London, according to quality, 23s. to 27s. Sulphate of Ammonia, £14 10s. to £15 per ton. Sulphuric Acid, concentrated 1845 1d. per lb., brown 1712 0½d. Superphosphate of Lime, £5 10s. to £6 6s. per ton. Blood Manure, £5 5s. to £7 10s. per ton. Linseed Cakes, best American, £11 12s. 6d. to £11 15s. (brl.), ditto £11 to £11 7s. 6d. (bag); English £11 5s. to £12 per ton. Rape Cake, £9 5s. to £9 12s. 6d. per ton. Cottonseed Cake, very scarce. Marseilles Cake, £10 5s. to £11 10s.

E. PURSER,

London Manure Company, 116, Fenchurch Street, E.C.



The Horse



Handwritten text, likely a title or description, written in a cursive script. The text is partially obscured by the image and is difficult to read.

THE FARMER'S MAGAZINE.

APRIL, 1861.

PLATE I. THE NORTH STAR; ONE OF "THE OLD SORT."

"If there is one animal more difficult to get than another, it is the old-fashioned hackney, combining blood with power and moderate height. This class at Canterbury was one of the worst sort; but at the Yorkshire meetings I saw them come out in great force, though even in the most favoured districts I cannot award to them much praise. The old-fashioned hackney has nearly degenerated into the coarse, vulgar, butcher's horse, with generally a coarse head and hairy heels. It is, in fact, a very chance-bred horse; and though one now and then sees a blood-like cob, it is quite a rarity. This class should be encouraged at the Royal Agricultural Show, and a £30 prize would not be thrown away upon it." So says Mr. Earle Welby, one of the judges at the last meeting of the Royal Society, and *here* we fancy is what he means—the old-fashioned hackney, combining blood with power—the blood-like cob, as so exactly illustrated in our engraving. What a pity it is that an authority who can go so well, and can on this point write so sensibly, should have marred his paper with such suggestions as recommending the admission of cock-tail stallions to breed hunters from; or would bring down the character of a national display of horses by suffering none to enter, but that should serve at five guineas each! If the Royal Agricultural Society would do well in this way, it must be careful only *not* to act upon the advice thus offered in its own *Journal*.

The North Star is all Mr. Welby wants—purely descended from the old sort, and not "chance bred" from crosses and mongrels. He is Yorkshire, too, having been foaled at Thixendale Wold, Friday-Thorp, near Malton, where the Messrs. Cook reside; a family famous for having bred more real roadsters than any people in Yorkshire, or probably in England. North Star, dropped in the spring of 1854, was by a horse of their own, called Cook's Wildfire, dam by Fireaway, grandam by Performer, and Performer by Pretender.

Wildfire, the sire of North Star, was by Ramsdale's Wildfire, dam by West's Fireaway, by Old Smoker. Ramsdale's Wildfire was by Kirby's Wildfire, and so they run back, ever preserving

the same patronymic, like the Prickwillows and Phenomenons. Cook's Wildfire was a well-known prize horse. In 1856, when three years old, he took the premium at Market-Weighton as the best entire horse of his sort, beating twenty-three others shown against him; and he also won in the same year at Hedon, Bridlington, and Driffield. In 1837, he was first at Sutton and Driffield, as well as at the Great Yorkshire Meeting at York. In 1858, Wildfire again won at Sutton, and also at Patterington. To follow the performances of the sort farther back, would be but to echo similar successes. The progenitors of The North Star have carried their twelve stone and trotted their seventeen miles within the hour; or for a shorter spurt, their two miles in five minutes. Some of them have won as much as four hundred on a trotting match, while they have been sold singly for a thousand guineas each. The records of the agricultural gatherings for many years past, of course testify to their triumphs.

And The North Star is worthy of his ancestry. Without a cross of blood in him, but all pure roadster for generations back, he is the very model of what the Yorkshiremen are wise enough to like. As they argue, "Give us the pure sort, of whatever its kind, and then we shall know how to deal with it *in* crossing. But if we have a stallion of mixed blood we never know how far it is mixed, or how to go on with it, or what will become of it." How say you to this, Mr. Welby, who would not by any means have the roadster chance-bred, but would still sanction such an experiment as the breeding of hunters by putting two crosses together? In his appearance The North Star clearly shows what he comes of, although the engraving does not make him so handsome, especially about the head, as in the original picture. This, in the flesh and on the canvas, was very bloodlike, heightened as the effect was by his beautiful black-brown coat, not a very common colour amongst horses of this sort. Then he had the long, strong, sloping shoulders of a hunter, the power of a dray-horse, and a clean flat leg that measured nine inches below the knee. His height was a good fifteen-two.

The crowning point, however, of all his excellence was his action. As the German Baron said when he saw him out at Hasketon—"Ah! superbe! One leetle run more! *Magnifique! One run more!*" until Mr. Weatherby and his owner began to think the distinguished foreigner would never tire of seeing him go. And we ourselves saw The North Star on parade at both the scenes of his successes in the South, whither he only came in 1860. But at the Norwich meeting he had a shoe loose, and the side of Framlingham Castle Hill, however pretty and picturesque, was not just the place to show a horse off. Still, whether walking, trotting, or standing to his number on the ground, there was nothing to compare with the Yorkshireman. The dumpling-eating worthies of Norfolk have been crossing their famous Phenomena out of their own strain into something bigger and worse, and in Suffolk the want of a real roadster was as much felt. Captain Barlow then did good service, when on his return from one of his Northern tours he brought the brown horse back with him; though we have already, as it will have been noticed, had to speak of the young Wildfire in the past. The German Baron, despite his notes of admiration, was no buyer; but the agent of another foreign noble came, saw, and took him. The North Star was purchased by Mr. Cavaliero for Prince Esterhazy's stud, and when he had got a lot aboard, Mr. Weatherby, who went to bid them *bon voyage*, declared the Hasketon horse was worth all the rest. But The North Star has left some good remembrance behind him. Previous to coming into Suffolk he covered for three seasons in Lancashire, and his stock, now rising three years old, are remarkably promising, of good shape, and good goers. Mr. Burch's roan mare, which

took premiums at the Suffolk and the Canterbury meetings in the hack or roadster class, has also just thrown a filly to him, with the finest action for a foal perhaps ever seen. But then her sire's was not merely *magnifique!* to look at, but he, too, like his fathers before him, had done his seventeen miles an hour. In a word, The North Star, either for purity of blood, style, and symmetry of appearance, or perfect action, was altogether one of the prize-horses of his order. There are but too few of the old sort left in the country, and it must be a source of regret that he ever went out of it.

But Captain Barlow has generally a good one or two for the use of his friends and neighbours. Years since he brought the rare old Robinson amongst them, and later the handsome Revenge or Recovery, one of Sir Tatton's favourites. Often have we seen them as the cynosure of the show-ground. Robinson, renowned for his hunters, died at Hasketon; and the little chesnut is just gone into Glamorganshire. In their place they have now at the Shrubbery Farm two young Melbournes—Oultston, a son of "Old Alice," and Middlesex, for the promise of whose young things, both in the East and in the Vale, we ourselves can bear witness to. Oultston has a higher mission, and should surely get race-horses. Russley, indeed, is still in force for the Two Thousand, while his sire is to have something like a chance now, as some very stately dames have already arrived. Amongst others there are Mathilde, the dam of Merryman and Contadina; Medea, by Pyrrhus the First; Eva, by Pantaloon; Attraction, Eltham Beauty, All's Well, Perfume, Beatrix, Vest, The Lady of Silverkeld Well, and many more. So that, although The North Star has set, we may see some yet greater luminary rising in his stead.

PLATE II.

WEST COUNTRY DOWNS,

THE PROPERTY OF MR. W. B. CANNING, OF CHISLEDON, SWINDON.

This pen of ewes, as the customary inscription on the plate declares, stood first in their class at the Royal Agricultural Society's Meeting at Canterbury. But, even beyond this, for general uniformity of character, as well as for a certain handsome and useful appearance, there was no other "lot" equal to them. You turned them round, and took your pick of one as the best; and the next minute, with another grouping, you found another better still. If anything they were, perhaps, a *little* too well "got up." Of course, they were quickly picked up, being sold during the week to go to New Zealand, at £17 a-piece. None of the pen had ever previously been exhibited. Their breeder, however, Mr. Canning, is coming to be rather famous for the sort. At the Salisbury Meeting of the Royal Society in 1857, his pen of five shearling ewes took the first premium of £20 in the Open Class, and another special prize of £20, given by the Local Committee, for Hampshire Down sheep. Mr. Canning has also been a winner at the Smithfield Club

Show in 1857, 1858, and 1859 for some of the best "Shortwools not Southdowns;" while he has received many local awards for the best lots of a hundred ewes, a hundred wether lambs, and a hundred ram lambs—premiums offered at the Marlborough August fair, and which afford a very trying test of the real strength of a man's flock.

Mr. Canning himself has been a breeder of West Country Downs for the last twelve years; but many of his ewes were from his father's flock, and others purchased from an established breeder in Wiltshire. More recently he has been using some tups from the stock of the well-known Mr. Humphrey, of Oak Ash, near Wantage. Chisledon is in a cold country, with the land in winter very wet and dirty; and for such a district the West Country Downs are admirably adapted—being very hardy, of a naturally strong constitution, and good wool-bearers. The ewes are excellent nurses when taken care of, and bring a great average of lambs, which come out early for sale;

and many of the sheep at a year old will, with moderate feeding, weigh from twelve to fifteen stone each.

The distinction between the West Country Down and the Hampshire Down is not very strongly marked; but Mr. Spooner, in his paper on Cross-breeding, in the Journal of the Royal Agricultural Society, thus sketches the history of the Wiltshires, or West Country sheep: "Here the same large, flat-sided uncouth horned sheep, whose ancestors were its denizens in the days of the Romans, ranged over the Wiltshire Downs, and indeed, retained possession some years later than in Hampshire. They at length succumbed to the superior qualifications of the Sussex Downs which gradually displaced them, not by crossing them out, so much as by being substituted in their place, and thus the imported Sussex became the West Country Down. At length a larger sheep and particularly a larger lamb was demanded, and then the Wiltshire breeders procured rams from Hampshire, and greatly improved their flocks in size, and secured larger lambs. Beginning with Sussex ewes, they have increased the size of the frame without materially enlarging the heads, and thus a very valuable breed of sheep has been formed, the Wiltshire Down, whose more perfect symmetry frequently enables their owners to wrest the prizes from the Hampshire men, and to cause the latter, by the rivalry thus induced, to improve the symmetry of their sheep by careful selection. The *Wiltshire Down* breeders, therefore, began with the Sussex ewe, and crossed with the Hampshire ram, whilst the Hampshire breeders used the original horned ewe and the Sussex ram. The latter, therefore, have less of the Southdown than the former, and, though of greater size and producing somewhat larger lambs, have less symmetry."

Mr. Humphreys, to whose flock we have already referred, speaks indiscriminately of the Hampshire or West Country sheep; but thus testifies to their excellence: "My object has been to produce a Down sheep of large size with good quality of flesh, and possessing sufficient strength and hardiness to retain its condition while exposed in rough and bad weather to consume the root-crops on our cold, dirty hills. Independently of the value of the Hampshire or West Country Down in an agricultural point of view for such localities as ours, they produce when slaughtered a valuable carcase of mutton, giving the consumer a good proportion of flesh to the fat, which is a point that may be too much lost sight of. I will, in proof of it, relate an instance which a gentleman told me the other day. When residing in another county he sent to his butcher for 3 lbs. of mutton. The fat seemed so much out of proportion to the lean, that he had the curiosity to weigh the lean. After carefully cutting it out, he found it to weigh $\frac{3}{4}$ lb., or only one-fourth of the whole. This anecdote indicates to those who are attempting by crosses to establish a new breed, or to improve an old one, the importance of producing an animal in which the flesh forms a due and sufficient proportion of the whole."

Mr. Charles Howard, of Biddenham, in a paper read at the Central Farmers' Club last year, goes far

to confirm all we have quoted from Messrs. Spooner and Humphreys, although he rather demurs to the appetites of this sort of sheep: "The Hampshire and West Country Down is a very important branch of the Down family; and as the Sussex Down is the favourite in the eastern counties, so is this breed in the western and south-western counties. Again, as the Sussex Downs are descendants of the sheep which formerly occupied those hills, the latter are descendants of those white-faced horned sheep that had ranged from a very early period the hills and downs of Wiltshire and Hampshire. Their improvement dates from the commencement of the present century, when recourse was had to the Southdown; from successive crosses this very valuable class of sheep was established, and I think it will be generally admitted that a flock of Hampshire Downs now presents as great a uniformity in wool, colour, and general appearance, as their smaller but handsomer cousins the Southdowns. They have lately rapidly risen in public estimation, and find considerable favour in the London markets. But it is said by some (with what truth I know not) that, like the Londoners, who are fond of them, they have rather large appetites. A gentleman who stands high as a successful exhibitor of this class of sheep at our national shows, in reply to my inquiries, states that 'they are the best description of sheep for Wiltshire, Berkshire, and Hampshire; in fact, the large sheep fairs, such as Overton, Alresford, Wilton, Ilsley, and Weyhill, are supplied with very little stock of any other sort; they are very hardy and of good constitutions, good wool bearers (the average weight of a well-kept flock is from 6 to 7 lbs. each fleece), of early maturity, and have plenty of lean as well as fat meat; they will graze to almost any weight you may think proper to make them.' The same gentleman also states 'that they have been very much improved the last few years by a slight cross with the Southdown.' Another gentleman, not a breeder of Hampshires, but who has had considerable experience in the feeding of them, states that 'they are a good useful sheep: the better bred ones will bear comparison with other breeds; but there are some not to be desired—those that are too large are very slow in feeding, and when fat are of second quality; and in his opinion 'it is very easy to get a Hampshire too big.' The ewes are good breeders and sucklers, and combined with the excellent management they receive in these counties, some most extraordinary lambs are raised, which at barely eight months old command enormous prices at their autumn fairs. Their draft ewes also find a ready sale, and are distributed throughout many parts of England, chiefly with the view to cross with the Cotswold or other long-woolled rams; but the former is more commonly used, and I have seen some very wonderful lambs the result of this cross."

Mr. Thomas, of Bletsoe, said at the same meeting that "for some years he farmed in Essex, and there he found no sheep do so well as the Hampshire Downs." Mr. Canning himself marks no distinctive difference between the Hampshire and West Country Downs, as improved to their present excellence.

A DROP OF RAIN-WATER.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

In two previous papers (ante pp. 98 and 140), I have endeavoured to trace the origin and progress of the aqueous portion of the air we breathe. We have followed that vapour as it rose into the atmosphere from the surface of the earth: we have marked its equally insensible descent in dew. I propose in this concluding little section to invite my readers to note some of the phenomena which attend the deposition of that atmospheric moisture, in a state which is more evident to our senses, either fluid in drops of rain, or solidified in the hailstone or the snowflake. In tracing together these things, we shall hardly advance a step, without remarking facts of abounding interest to the skilful agriculturists of our country.

We have seen that the atmosphere at a temperature of 65°, when saturated with moisture, contains about 8 grains of water. We find that at a lower temperature its power to retain the water decreases; and, therefore, when the warm saturated air has its temperature diminished, that it has to part with a portion of its water, which then ceases to be insensible moisture, it appears as cloud, or fog, or rain.

We can only trace the effects of thus cooling a warm and saturated current of air, by following the lower currents of our atmosphere. We find, that certain of these, flowing over the warm surface of equatorial seas, soon become saturated with moisture. Then again we note that if these great currents meet, in their course, mountains of considerable height, that then the warm current is directed upwards, becomes rapidly cooled, and so unable to retain the moisture with which it is saturated, and torrents of rain are then showered down on the sides and tops of such elevated mountain ranges. It would be reasonable to conclude that this was owing to the cooler atmosphere with which these warm sea-borne currents mingle as they ascend the mountain sides: various careful observations made at different heights show that this is the case. M. Gay Lussac, from remarks made during balloon ascents, concluded that the temperature of the atmosphere decreases one degree for every 352 feet of elevation. In ascending the higher mountains of our earth, we find that the mean temperature gradually decreases until we arrive at the line of perpetual snow. That point of eternal frost varies in altitude from the level of the sea near the poles, to about 15,000 feet near the equator.

For the better understanding of this portion of our inquiry, let us follow the course of a constant warm sea breeze or trade wind, and see how by its course being thus slanted up the sides of highly elevated mountain ranges, it places certain portions of their sides in almost never-ending rain, and other portions in a state of almost perpetual dryness. To this end let us trace the great south-east trade-wind of the Atlantic, follow it across the ocean, on

to the shores of Southern America, witness the endless profusion of rain it showers down on the eastern sides of the Andes, follow it over the peaks of eternal snow which occupy their summits, and thence, after it has thus been deprived of its moisture, trace it as it descends from these elevated ranges, over the low heated arid districts of Peru, until it again disperses itself over the warm surface of the Pacific, to again absorb that moisture which it will again deposit on colder surfaces of the globe. This course of the Atlantic south-east trade-wind, and the rain phenomena attending its course, Maury has described in language which I need not attempt to vary (*Phy. Geo. Sea*, p. 294). He says that "the coast of Peru is within the region of perpetual S.E. trade winds. Though the Peruvian shores are on the verge of the great South Sea Boiler, yet it never rains there. The reason is plain. The south-east trade winds in the Atlantic Ocean first strike the water on the coast of Africa. Travelling to the north-west, they blow obliquely across the ocean until they reach the coast of Brazil. By this time they are heavily laden with vapour, which they continue to bear across the continent, depositing it as they go, and supplying with it the sources of the Rio de la Plata, and the southern tributaries of the Amazon. Finally they reach the snow-capped Andes, and here is wrung from them the last particle of water that that very low temperature can extract."

Reaching the summit of that range, they now tumble down as cool, and dry winds on the Pacific slopes beyond. Meeting with no evaporating surface, and with no temperature colder than that to which they were subjected on the mountain-tops, they reach the ocean before they become again charged with fresh vapour, and therefore before they have any which the Peruvian climate can extract. The last they had to spare was deposited as snow on the tops of the Cordilleras to feed mountain streams, under the heat of the sun, and to irrigate the valleys on its western slopes. Thus we see how the top of the Andes becomes the reservoir from which are supplied the rivers of Chili and Peru.

Supposing these observations to be correct, we might reasonably expect that up to a certain elevation on a mountain side, the amount of rain would steadily increase. Careful observations with rain gauges thus placed, show that such indeed is the case.

This remark does not indeed apply to gauges placed in level districts at only a few feet from the ground—since, for some cause not yet clearly explained—the rain gauges placed near the earth collect more rain than those more elevated. This was long since noticed in the cases of some gauges placed on York Minster and other high buildings; and this was supposed to have arisen from eddies

of wind; but when the gauges were placed on posts of different heights, removed from any disturbing causes, similar results were obtained. Mr. Phillips placed five gauges at different heights from the surface; they all collected different amounts of rain. on an average of two years that placed at

24 feet collected	24.158 inches.
12 " 	26.039 "
6 " 	26.109 "
3 " 	26.298 "
1½ " 	26.559 "

On the sides of mountains a different result is obtained; for there, up to a certain elevation, the amount of water collected by the rain gauge increases with its elevation above the level of the sea. From Mr. Miller's observations, we find that in Cumberland the amount of rain increases as we ascend the mountain side, until it attains its maximum at about 2,000 feet. In 1848 it was at

Whitehaven	78 feet	36.334 inches.
" 	90 " 	47.342 "
" 	480 " 	46.700 "
Bruntrigg 	500 " 	109.19 "
Styehead 	1290 " 	138.72 "
Sprinkling Tarn ..	1900 " 	148.39 "
Great Gable 	2928 " 	91.32 "
Scaffell Pike, the highest point in England	3166 " 	64.73 "

On the west coast of India the line of maximum fall would appear to be about 2,500 feet higher than with us. Colonel Sykes (*Trans. Roy. Soc.*, 1850, p. 362) has given the fall at different stations:—

At sea level, west coast.....	81.70 inches.
150 feet, Rutnaghery	114.55 "
900 " Dapolee.....	134.96 "
1740 " Kundalla.....	141.59 "
4500 " Mahabuleshwur....	254.05 "
4500 " Uttray Mullay in Travancore	263.21 "
6100 " Kotergherry, on the Neilgherries.....	81.70 "
8640 " Dodaballa, the highest point of Western India.....	101.24 "

It is not only the elevation above the level of the sea, or above the surface of the land, which influences the amount of rain collected by the rain-gauge: the size of the gauge appears, for some unexplained reason, to vary the quantity collected. Mr. T. R. Lawes found, at Rothamsted, in Hertfordshire, that where a small rain-gauge collected an annual fall of 22.23 inches, a large gauge (equal to 1-1,000th of an acre) placed by its side collected 29.30 inches.

Rain-water, thus collected at a distance from populous places, was once supposed to be pure water. The fact that a variety of impurities, soluble and insoluble, were constantly exhaling from the surface of the earth, or raised by the winds, and mingling with the atmosphere, was quite disregarded: what became of them there, no one paused to inquire. The celebrated Swedish chemist, Bergman, however, towards the close of the last century, discovered in rain-water traces of nitric acid. Then Liebig, in our time, found in it

ammonia. The proportions of these substances present in an imperial gallon were not long since determined by M. Baral, an eminent French chemist. He found in an imperial gallon of water—

Grains.

Of ammonia (the mean of five months, from August to December)	0.240
Of nitric acid.....	1.350

The mechanically-suspended matters in rain-water vary according to the locality in which it is collected. In the neighbourhood of populous places, there is a deposit of finely-divided soot. This has been detected in places to the leeward of London, more than twenty miles distant from the city. Rain of different colours has been recorded. Minute snails, and even larger animals, such as small fish and frogs, have mingled with other showers. There are, probably, minute proportions of other matters occasionally united with rain. There is a particular scent discernible in some showers, such as those falling near the sea, or in the neighbourhood of manufacturing districts, which must arise from the presence of peculiar foreign substances.

The deposition of the aqueous portion of our atmosphere is not always in the liquid state, as in rain: it descends upon us in the solid form, in snow, and in ice or hail. If we inquire into the origin of these, the answers we receive are but imperfect. We believe that snow descends from the clouds; but we have no reasonable certainty that it exists in the state of watery vesicles in those clouds, which are frozen and enlarge as they descend; or that it exists as clouds of fine flakes, supported by the force of under-currents of air. Snow appears to us in crystals of varying shapes and beauty. When under the microscope, they appear as modifications of stelliform and hexagonal crystals. Often they consist of stars of six rays, composed of prisms united at angles of 60 deg.: from these other prisms shoot, at similar angles. But there are numerous beautiful variations in the shape of the crystals of snow, produced most probably by different states of the atmosphere. The density of snow is much less than that of ice. Ice is only about one-ninth larger in bulk than the water of which it is congealed; but the bulk of snow is more than ten times greater than the water of which it is formed. A depth of about 10 inches of snow, when melted, hardly produces one inch of water.

As the temperature of the atmosphere decreases, as we ascend mountains, by pretty regular degrees, it would follow that at certain elevations we should reach the point where the thermometer is always below the freezing point of water, and that consequently, at such point, the snow should never melt. Now this is found to be the case in most portions of the earth. In considerable elevations, we arrive at the point where the snow remains during the whole year. These altitudes, as might be expected, are the most considerable under the Torrid Zone, the perpetual-snow line gradually descending towards the level of the sea, as we approach the poles of the earth. The following table gives, in feet, the line of continued congelation above the

level of the sea, and the mean temperature of the level of the sea, in different latitudes (*Banfield and Weld's Stat. Comp.*, p. 8):

Latitude.	Congelation.	Temperature.
0	15,207	84.2
5	15,095	83.8
10	14,764	82.6
15	14,220	80.7
20	13,478	78.1
25	12,557	74.9
30	11,484	71.1
35	10,287	67.0
40	9,001	62.6
45	7,671	58.1
50	6,334	53.6
55	5,034	49.2
60	3,818	45.0
65	2,722	41.3
70	1,778	38.1
75	1,016	35.5
80	457	33.6
85	117	32.4
90	000	32.0

The composition of snow is not quite the same as rain-water. Boussingault examined both rain and snow-water: he found in a gallon of—

	Grains.
Rain-water, ammonia	0.210
Snow-water collected on the earth	0.454
„ collected on a stone terrace	0.080

There is also a considerable absence of the atmospheric gases in snow. Fish are said to be unable to live in melted snow-water.

Hail is another solid form in which the aqueous moisture of the air is deposited on the earth. Hailstones most commonly are composed of an opaque centre, like compressed snow, encased in another circle of ice. These are usually of about a quarter of an inch in diameter, but they occasionally fall of much larger sizes. In very great hailstorms, they have been found two or three inches in diameter, and weighing several ounces. Hail commonly falls before rain storms—often with them; but very rarely after the rain. The hailstorm is generally of only a few minutes' duration, only very occasionally lasting for a quarter of an hour.

Various theories have been proposed as explanations of the origin of hail. That it is composed of the congealed vapour of the atmosphere, and that, when once the nucleus is formed, the hailstones increase in size, as by the condensation of vapour they descend, is perhaps the only portion of the enquiry that seems to be generally admitted; and that descent, it is probable, is in some cases so retarded by strong currents of air as to give time for unusual enlargements of the hailstones. The other portions of the investigation are about as much understood as when Job asked (xxxviii. 22, 29), "Hast thou entered into the treasures of the snow? or hast thou seen the treasures of hail? out of whose womb came the ice? and the hoary frost of Heaven, who hath gendered it?"

We have seen, then, that the aqueous vapour, when condensed in the atmosphere, descends upon us again, in the course of its eternal circles, in a

drop of rain, a flake of snow, or in still more gently deposited dew: the water has again fallen on the earth, or mingled with its surface waters. In some portions of the sea in fact, as off the coast of Patagonia, the rainfall is so copious that the surface of the sea is quite fresh, according to Darwin, from the vast quantity of rain that falls on its surface.

On the surface of the earth, the rain is partly evaporated from the soil by the winds and sun, or absorbed by the vegetable world, and partly drains away. On many of our cultivated soils, this drainage is aided by artificial means: either by open or surface drains, or by those underground, placed at various depths and distances, according to the varying tenacity of the surface soil, or the substratum on which it rests.

The proportions of a given quantity of rain which evaporate from, or drain away from different soils, have been ascertained by various experiments. I have elsewhere given the amount of both these as regards the chalk and limestone soils, by which it will be seen that the evaporation is the greatest on the limestone, and the drainage but small; whilst, on the contrary, the evaporation, as might be expected, is much less considerable on the chalk soils, and the sinking in of the rain far more considerable.

From clay soils the underground drainage is much more slow, the surface drainage and evaporation more considerable. Mr. J. Bailey Denton found on the soils at Hinxworth (*Jour. R. A. S.*, vol. xx., p. 275) that when 227,240 gallons per acre fell upon that estate during eight months, that on the free soils 160,920 gallons of that rainfall found their way into the drains, but from the clay soils only 59,936 gallons per acre. It is these drainage waters which constitute our springs; and these, when united, increase into the rivers of our globe. Most of these natural underground waters influenced materially in their course by the strata they meet with, they are occasionally diverted from their course during their descent, by meeting with slowly permeable strata; and hence, in rainy seasons, long dried-up springs reappear, and pour their waters into lower districts.

There are certain intermittent springs in the great southern chalk formation of England, which arise from this varying amount of the rain-water descending through the earth. They are rather curious in their movements, and appear at different periods of time. In some places, as at Croydon, Epsom, "the Bourne Mill," near Farnham, and Gattin, near Merstham, they make their appearance at intervals of some years: at other places, as at Lewes, in Sussex, and the Winterbournes in Dorsetshire, they flow every winter. These phenomena have been explained in more primitive days than ours in a variety of amusing ways. It was supposed, in the times when witchcraft flourished in England, that these bournes were kindly sent to warn us of coming death and sickness. Then it was with equal wisdom imagined that the bourne was vomited forth by a great siphon fancied to exist in the chalk hills, the concoctors of this myth not being aware that siphons do not cause springs to rise higher than their original level, and that Dame Nature does not need their aid to enable

water to fall by its own gravity. There are various curious matters about the flow of these intermittent springs, which puzzle even the philosopher to explain. For instance, Mr. J. B. Knight, of West Lodge, in Dorsetshire, tells us, after graphically describing these waters or winterbournes, which annually burst at the heads of valleys enclosed by chalk hills, in Dorset and Wiltshire, and commonly afford the prefix of *Winterbourne* to the parishes where they occur, such as Winterbourne Tarrant, &c., that one curious fact in relation to the annual bursting of these springs is, that their "breaking," as it is termed, is always accompanied with strong gales of wind, generally from the south-west, with rain; but *without a strong gale they never break, however wet the season.* The peasantry of Dorset tell you that the first outbreak of these bournes was never yet beheld by any mortal eye; that not only do they come like the witches in gales of wind, but that, like the weird sisters, they are at first invisible.

The origin of these *annual* bournes is pretty evident; all the rainfall upon the chalk formation either evaporates or sinks into the earth; there is little or no *surface* drainage there. In the *summer* months the rain which it receives is almost entirely *evaporated*; there is little or no overplus to feed its bournes. But in the *autumn* and *winter* months the case is reversed; the *smaller* portion of the rainfall evaporates from the surface of the soil; the larger portion descends beneath it, and either enlarges the flow of the *constant* streams of the chalk, or forms new outbursts or winterbournes.

If, however, the rainfall considerably exceeds the average annual amount, why then it happens that in certain places the old streams or bournes, are either unable to discharge the unusual amount of water with which the chalk hills are surcharged, or, what is nearly the same thing, there are certain veins of earth in the chalk which filter the water more slowly than the chalk which rests above them: in either case the result is the same—the water is retarded in its descent, and is diverted into other outlets on a higher level than those of the old springs, and these irregular outpourings are the bournes of Croydon and other places.

Let us for the better understanding of this follow the rainfall upon the chalk a little more closely. The annual average rainfall in Surrey is about 24 inches, or 2,400 tons per acre; of this quantity we learn from some experiments carried on for some years by Mr. Dickenson, on the chalk soils of Hertfordshire, the evaporation by the sun and winds carries off about 14 inches, or 1,400 tons, and about 10 inches, or about 1,000 tons per acre, sink into the earth, and are discharged by the springs or other natural drains.

When, however, an unusual fall of rain occurs, say thirty inches of water during a similar period, a very different state of affairs take place. 3,000 tons of water per acre now descend upon the land. The *evaporation* from that soil, however, remains nearly the same, viz., about 14 inches in depth, or 1,400 tons of water per acre, whilst the *drainage* water is increased from 10 to 16 inches, or from 1,000 to 1,600 tons per acre; an outlet, therefore, is now needed that will convey 600 tons of water

per acre more than in years of average rainfall. If this tracing of the course of the drainage waters of the chalk is correct, then it ought to follow that the Bourne at Croydon, and other places of its irregular outpouring, should make its appearance soon after any unusual annual rainfall. Now, I find that whenever the rainfall in one year is about 30 inches the Bourne makes its appearance in the close of the year, or early in the ensuing spring; and that whenever the rainfall considerably exceeds 30 inches in the year, as in 1818 (33·4 inches), 1821 (34·5 inches), 1824 (36·3 inches), 1841 (33·3 inches), 1852 (34·2 inches), the Bourne flows copiously.

Year.	Rain.	Flowings.
1815	22·5	..
1816	30·1	..
1817	29·0	..
1818	33·4	Bourne copious.
1819	31·1	..
1820	26·2	..
1821	34·5	..
1822	27·7	Bourne copious.
1823	27·1	..
1824	36·3	..
1825	24·5	Bourne very copious.
1826	23·0	..
1827	24·9	..
1828	31·5	..
1829	25·2	Bourne moderate.
1830	27·2	..
1831	30·8	..
1832	17·7	..
1833	23·0	..
1834	19·6	..
1835	24·9	..
1836	27·1	Bourne moderate.
1837	21·0	..
1838	23·8	..
1839	29·6	..
1840	18·3	Bourne moderate.
1841	33·3	Bourne copious.
1842	22·6	..
1843	24·6	..
1844	24·9	..
1845	22·4	..
1846	25·3	..
1847	17·8	..
1848	30·2	..
1849	23·9	Bourne moderate.
1850	19·7	..
1851	20·15	..
1852	34·2	Bourne moderate.
1853	24·37	Bourne copious.
1854	18·92	..
1855	24·38	..
1856	22·72	..
1857	21·06	..
1858	15·78	..
1859	25·54	..
1860	30·08	Bourne moderate.

When the spring makes its appearance by the hill-side, it begins to travel by its own gravity to mingle with other springs. As soon, however, as the water bursts forth, evaporation from it begins, and if its course is considerable before it meets

with accessions from other springs, its progress is often stayed; it forms wet swamps, or feeds ponds or lakes without outlets. We have instances of this in various places in England. In foreign lands, however, in warmer and drier climates than our own, we have instances on a grand scale, where the evaporation from the surface of an inland sea or lake is sufficient to balance the amount of all the streams which flow into it. The Dead Sea, for instance, receives all the waters of the river Jordan; the Ural Lake in Asia, does the same with two or three considerable rivers. The Caspian provides for all the waters of the Volga. The Lake of Tule, in the Californian Valley, absorbs the river St. Joaquin. Now, as none of these great inland waters have any outlet, it follows that the evaporation from their surface exactly equals the

weight of water poured into them. If the rivers in their course traverse a long line of dry country without receiving any tributary streams, there the extent of the evaporation and absorption by its banks either materially diminishes the size of the stream—as in the case of the Euphrates, in its course from the mountains of Armenia, through the riverless plains of Arabia—or the stream is at last entirely exhausted or lost in a swamp, as is the supposed case with one or two of the African rivers. With these evaporations, again recommences that eternal circle of which we have been tracing the course; again the water rises in vapour, is again wafted by the winds, to be deposited, in dew or rain, over those thirsty soils, which but for this beneficent arrangement of its Creator would ever be hopelessly barren.

THE HERDS OF GREAT BRITAIN.

CHAPTER XXV.

THE BARTON HERD.

We hardly know how it is that we have roamed, either on business or pleasure, into nearly every county in England except Devonshire. We had put our head straight for it often enough down the Great Western Line; but, like the man with "the wilful legs," who never could pass a tavern, we had either turned off at a tangent to the Tubney kennels, at Didcot, or Mr. Tom Parr's at Farringdon, or cantered across the country from Shrivensham to have a day's coursing at Ashdown, or plunged boldly among Mr. Stratton and his three hundred from Swindon, till the land of apple orchards, shady lanes, junkets, and syllabubs became a complete mirage. However, "*Paddington to Exeter*" was printed legibly enough on our night-train ticket at last, and we fairly realized in the coffee-room next morning, that we were well out of the Booth, Bates, and Towneley jurisdiction, and about to do suit and service to the Red and All Red dynasty. Those who remember Douglas Jerrold's string of sparkling conceits to a foaming ale cup, or saw Exeter Hall rise to a man, when Temperance Gough held aloft, and apostrophised a tumbler of cold water, can imagine, if they like, what those great word painters would have said or written subsequently, if they had come down in their slippers, and found, for the first time in their lives, a dish of clotted cream flanking their eggs and muffin.

The patent of its peerage among creams dates back, it is averred, to the early part of the last century, but the "*Herd Book*" does not take us back much further than '27. Devon breeders could have given its editor much more information from their private notes, but as there was no prize system in existence before that, the interest of the public in the matter would hardly have been commensurate. Forester (46) and his grandsire (bred by Mr. Tanner Davy) are the first bulls of note which it records. The former, which was bred by Mr. James Quartly, received his name for his labours on The

Forest, where Mr. Knight used him with such complete success, that his breeder bought him back, and after a stay at Molland, he was resold to Mr. J. Reynolds, of Thorverton. Thirty years before that, the herds of Quartly, Davy, Moggridge, and the Haleses had flourished in and about Molland, but good bulls could be got for £15, and a crown was the highest service fee. Their fealty was put to a sore test during the war prices, as a cow could fetch her £25 as well as a bullock, and hence it was only a few of the very staunchest North Devonians who could not be tempted to sell their females, or who dared to go into the market and outbid the butchers. The kernel of the breed was preserved, but, as might have been expected, well bred Devons are not nearly so plentiful as they then were. It may be that we all dwell too fondly on the past, and forget that the eye was younger and more impressable; but we constantly hear Mr. Turner's opinion confirmed, that the lot of twenty cows of the late Mr. Michael Thorne's, which went to North Molton Fair about that time, were the best that Devonshire ever pitched for sale. This patriarch found few rivals as a feeder, and he was wont to reckon it as his proudest achievement, that one of his four-year-old steers killed to 29 score a quarter.

Some years before this, the Devons had gained a new settlement on the Eastern seaboard, among the turnips and partridges of Norfolk. That wide, full loin, neat fore-quarter, juicy steak cut, small bone, and absence of coarse beef, along with that winding horn, and bright deer-like eye, had not failed to strike the late Earl of Leicester, when he visited Davy's, Quartly's, and Merson's herds in his "*searches after truth*," and beef. It was also through his present of six heifers, and a bull to Mr. Patterson of Maryland, that in 1817, they first found their way to the New World, where yokes of them form such a pleasant fea-

ture, in the great States Cattle Shows. They have spread so rapidly there, and so many entries have come in for the Herd Book, which was commenced by Captain Tanner Davy in 1851, that the three volumes have been reprinted on the other side of the Atlantic; and France and Australia also contribute to it. All the breeders find them especially calculated to brave cold, and thrive on scanty pasture. The numbers exhibited both at the Royal and Smithfield are annually on the increase; and last Christmas tide, the Shorthorns were only in a majority of five over "the juicy red line."

Their lack of size by the side of the shorthorn and Hereford, has created a prejudice against them, which their hardy qualities and their cream and beef talents have not enabled them to overcome. North of the Trent the Durham holds its own, and the Hereford is the favourite "beef machine" of the Midland Counties. Earl Beauchamp has, however, stood fast by them in Worcestershire; and Earl Aylesford, Mr. Stubbs (of Perry Bar), and Messrs. Abraham and Samuel Umbers have divided their Warwickshire favours between them and the Durhams or old Warwickshire longhorns. Mr. Samuel Umbers took his bull Birmingham to Chester, and won the first prize in the senior class, with The Zouave next him. Gloucestershire has sent in its adherence to them through Mr. G. Talbot, of Temple Guiting; and Shropshire, through the Childes of Kinet; and Sir Thomas Boughey, who bought and worked Turner's Duke of York (37), bred by James Quartly, and the first prize Royal winner at York and Exeter. Norfolk's luck among the prize ribbons has been in proportion to its early but limited allegiance to them. Mr. Blomefield stood next to Mr. Hammond for the yearling heifer prize, and won a cow prize as well (with one of James Quartly's breeding), when the Royal Agricultural met at Norwich; and the present Earl Leicester gained both a bull and cow prize there. Lewes also brought fresh successes to his lordship's herd, and his Holkham-bred steers and those fed by Mr. Heath and purchased from Quartly and Passmore have bravely held their own at Smithfield. Prince of Wales (105) was the Holkham patriarch for some time, and Quartly's celebrated Napoleon (259) is now there, after spending seven seasons in North Devon. Young Sultan, from Mr. Tapp of Twitchen, went to the Hon. Mr. Dudley Pelham's, in the Isle of Wight, which has furnished a strenuous breeder from Davy and Merson's blood in Mr. T. Wilkinson of Chauton Cowes. H.R.H. Prince Albert is alone among the men of Berks, and made no entries till the third volume of the Herd Book in '59; but his first with Prince Arthur at the Royal, and his subsequent victories in the same "tented field" with The Zouave, from Barton, and his constant successes at Smithfield and Bingley Hall, have placed the Devon blood at no discount by the side of its two rivals in the Windsor Pastures. Each Christmas brings out the strength of Mr. Farquharson's hand; but his winners have been Quartly bred; while Messrs. Pope, of Great Toller, Maiden Newton (the owners of Maiden and Lovely), and Miller of Sherborne, do battle for Dorsetshire at The Royal.

Mr. Warren of Child Okeford, near Blandford, is also another of its principal breeders, and Lord Portman secured the blood of the renowned old Hundred Guinea (56), for the county, through his son Champion.

It was Hundred Guinea who first added deep flesh, symmetry, and quality to the Somersetshire size; and for years after, his steers could be picked out from the rack at Taunton, Willington, and Bridgewater fairs. Messrs. Bond & Co., of Kingston, bought him from Mr. John Quartly, and along with Messrs. Farthing, Fouracre, and Gibbs, showed his stock with no small result. Lord Bridport and Mr. C. Boucher are also high up as Somersetshire breeders; but none have gone into it so resolutely as Mr. Hole, of Knowle House, near Dunster. He breeds back to Hundred Guinea (56); and Champion (17), Baronet (6), Prince of Wales (105), Earl of Exeter (38), Marquis of Salisbury (455), and a whole line of Quartly-bred Royal prize bulls have passed through his stalls. Champion (17), and the Cardinal (15), of his own breeding, got firsts at the Royal, and so did Queen-of-the-West (394) and Mrs. York (300), while Fair Maid of Somerset (695) and Belle of the West (529) helped to sweep away silver cups at Taunton, or earn cheques from the secretary of the Bath and West of England. Mr. Nurcomb, of Hope-cott Farm, near Knowle, breeds from that herd, and has principally used the Cardinal.

Mr. Tremayne, of Heligan, was one of the earliest breeders of Devons in Cornwall, and stuck close to the Davy, Moggridge, and Quartly blood; but Mr. Anstey, who was his agent, and began on his own hook some fifteen years ago, at Menabilly farm, near Fowey, goes for Quartly alone, and has bred latterly from Baronet (6), Earl of Exeter (38), and Napoleon (259) bulls. Mr. James Tremayne, of Newlyn, is also making great efforts; and Lord Falmouth, who was entered at Mr. Tremayne's sale, strengthened his herd not a little last September, by buying Mr. John Quartly's Duke of Chester (404), as well as some cows and heifers both from that herd, Mr. Turner's, and Mr. Robert Smith of Exmoor. Mr. Palmer, of Stoke Climsland and his brother have sealed their Royal Cornwall and Liskeard first-class successes, by their pilgrimage to Canterbury; but so far Mr. Sobey's success has been confined to the county, which is very loyal in its allegiance to the breed.

North Devon, which is very bleak, and fully three weeks behind the South, monopolizes nearly all the crack herds to itself; and it is only by attentive breeding and purchasing many of their best things to train, that Mr. Turner has been enabled to stand up almost single-handed for the honour of the Exeter district. Among the leading men of the North, we have Mr. Passmore of Bishop's Nympton, who was second with Actæon (1) at the Exeter Royal, and a few years ago placed the future Smithfield gold medallist in the ox and steer class, in the hands of that celebrated feeder, Mr. Heath, of Norfolk. Mr. Tapp of Twitching, bred Young Sillivant (121), a double first in Devonshire, and sold him to the late Mr. R. Merson. His sire Sillivant (120), from a daughter of Forester (46), was bred by Mr. Francis Quartly, and derived his name from the

donor of the silver cup, which he won at Exeter in 1835. Mr. James Quartly purchased him at the sale, when his venerable uncle gave up farming, and sold him afterwards to Mr. Childe of Kinetel. The name of Merson of Brinsworth, near North Molton, has also been connected with Devons for some seventy years; and the late Mr. R. Merson, who died in 1855, had his full share of winnings. Sultan (122), of his breeding, was second at the York Royal; and so were Cambridge (12), and Northampton (86) (subsequently sold to Mr. Umbers), which both won firsts at the towns that lent them their names. His brother's show-yard fame has not suffered in Mr. James Merson's hands, as his Prince of Wales (499), and the first prize Warwick cow, &c., can abundantly testify. Mr. Hole of Hanneford has also a tender recollection of Warwick for his first-prize bull-calf's sake; and of Rosetta (1026) and Camilla (563) as well, when they came out nearer home.

Mr. James Davy has gone very much lately upon the blood of James Quartly's *Flower* (189), with which the late Mr. John Tanner Davy won so many prizes at Exeter. The family have bred Devons for nearly one hundred and twenty years; and when Mr. John Davy died at Rose Ash, in 1790, he divided the herd between his two sons, of whom John Tanner went to Rose Ash, and William to Flitton. In process of time the former herd descended into Captain Davy's hands, the breeder of Mayboy (249), the first prize winner of the New York Agricultural States at Saratoga, Richmond (292), Mayflower (289), and Mayflower (285), dam and granddam of the prize bulls Lopez (64) and Proctor (109). Taunton, a well-known prize cow, and Quartly's Forester (46) also sprung from the Rose-Ash herd, which now contains much of the blood of Flower (190), Gem (201), Buttercup (1197), and Turner's Helena (223), whom Captain Davy purchased, and bred from after she won at York. Besides Western King (339), and its countless county winners, Flitton has brought out two first-prize royal bulls, to wit, Oxford (89) at Oxford, and Napoleon 3rd (464) at Salisbury; while Nelson (83) by Prince of Wales (105) from Flower, of Quartly's blood, was second at Windsor.

The village of Molland has quite a clan of breeders. It is five years since they lost their chief in Frank Quartly at four score and ten. He had given up business many years before he died; and his picture, which was presented to him by his friends in 1851, has found a place of honour in hundreds of Devon homes. He always considered that Curly (92) was one of the best cows he ever had; and Mr. John Quartly's Pretty Maid (366), the prize cow, and Hundred Guinea, a prize bull, at Bristol, were from her. An important era of cattle shows has set in since the old man first instructed his nephews, the brothers James and John Quartly, in all the secrets of herd craft, in that quiet valley, and they have spread his name far and wide through the Curly, Picture, Tulip, and Beauty tribes. At the Royal alone they have won about sixty prizes; and if John has bred Duke of Chester (404), Earl of Exeter (38), and Sultan (318), James has been more than even with him, with Duke of Devonshire (35), Baronet (6), Napoleon (259), Prince of Wales (105), Duke of York (37), and Warrior (548), all first prize bulls. Still there is no show-yard rivalry between them; they breed from the same stock and use each other's bulls entirely, and thus a prize gained by one of them tells equally for the other. The Halses of Molland, John and Philip, have bred chiefly for years back from the Quartly bulls; it was with two heifers by Napoleon (259) that Philip won the first and second yearling heifer prizes at Canterbury. The success was all the more pleasant, as some years since he had been compelled to kill off many of his best cows and heifers,

because the offensive smell from the "mundic" of some mines in the neighbourhood of their pasture had caused them, as the veterinarian supposed, season after season, to slink their calves. Mr. John C. Halse has only been twice to the Royal, where he won seconds with the Earl of Essex (407), (who was subsequently sold to the French Government), and Sultan Junior (530); but his Bingley Hall trips have been rewarded with a first prize and a silver medal for the best young steer, and the same for Fancy (708), as the best cow in her class. It was also from his Crocus that His Royal Highness Prince Albert bred his first bull-calf, which proved the prize fat steer in 1859; and he has placed a winning card in Mr. Turner's hands. Mr. Moggridge has sold many to the Prince, including the first steer at Smithfield in 1854, and the prize brother to the heifer, which was the first in her class and reserved medallist at Smithfield last December. This heifer was the first he ever fed, and he certainly has no master in the art of laying it on level. He was too unwell to accompany her to London; but a line from his friend James Quartly with the intelligence, made him throw physic to the dogs, and gallantly brave the journey. His Abdel-Kader (134) made Mr. Turner consider himself a lucky purchaser when he saw the first ticket over his head at Lincoln Royal, and the Bath and West of England as well; and his Beauty (24) was the granddam of Turner's Czar (172). Such is a mere outline of "the blood red hand" of Devonshire herd heraldry, the details of which we trust in due time to fill quietly in.

Mr. Turner commenced as a farmer and an extensive breeder of North Devons and Leicesters in 1818. The taste for them had been transmitted to him by his father, along with a large selection from a herd and flock which had taken some forty years getting together. The late Mr. Turner was the first introducer of Leicesters into Devonshire, and kept crossing them so carefully with rams from Stubbins and other crack men, that his letting average at Tiverton fair in 1814 ranged as high as 30 gs. In his son's time no expense has been spared to keep up this well-earned prestige, as nothing crosses better with the Exmoors for butcher purposes. The flock was strengthened by an extensive purchase of ewes at Joseph Burgess's sale; and its 150 guinea and 100 guinea rams shortly afterwards passed into his hands, and did good service for many years. Since then he has regularly hired rams from Stone, Hewitt, and Sanday; and in 1846 the 40 guinea prize for the best Leicester shearing (37 entries), fell to his lot at the Newcastle Royal; Mr. Robert Smith, then of Burley-on-the-Hill, coming second. About 380 ewes and lambs made up his draft sale in September, leaving 300 of his best ewes and ewe lambs, besides a few of the choice tup lambs principally by Mr. Sanday's Carlisle sheep. One of his earliest purchases of Devons on his own account was a cow at Barnstaple fair, which he sent to a good bull of Mr. Barker's, and from her, as well as Catalani, of Mr. Acland's blood, he bred several good things, more especially the bull Devonian, who did some execution in the show-yards of Devon and Cornwall. When the late Mr. Francis Quartly sold off his stock, Mr. Turner got a few of his cows, and one of them, Duchess, bred him Derby Joan, the winner of the first heifer prize at Derby. He did not commence his annual Royal trip with Oxford, but the next year (1840) he drew blood at his first essay, with a brace of heifers at Cambridge, and his Royal prizes (of which fully a third were firsts) have since then averaged as nearly as possible three a year, with Devons of his own breeding, or selected from the herds of Davy, Halse, Moggridge, or Quartly. Derby (23) at Derby, Prince of Wales (106) at Southampton, Protection (110) at Newcastle, and Duke of

York (36) at York and Exeter, and the Duke of Devon at Gloucester and Paris, were all first-prize bulls; and the same honour was awarded to The Zouave of his breeding, both at Chelmsford and Carlisle. He considers the Duke of York (37) by James Quartly's Prince of Wales (105) to be the best bull he ever had, quite as much for his look and handling as for his being the sire of two of his best cows, Lady (241) and Wallflower (472), the *prima donnas* of Gloucester and Carlisle. This thirteen-year-old lady claims a direct descent from Hundred Guinea and Forester, and is the dam of the 1860 Bath and West of England first-prize winner Prince Frederick (494); while Wallflower's best calf is Vaudine (1699), who has won two firsts and three seconds in her five public trials. Before the sale of the September draft, the herd consisted of about 65 in all, and as the calf accessions have since brought it up to 40, it will not shrink from its wonted wager of battle next July.

A walk of about three miles from Exeter, and for the latter mile or so through a true Devonshire lane, with its high, red gravel banks, on which hazel, elm, and "noxious ivy," all clustered together, brought us to the Barton homestead at last. We had a few minutes with the Chittagongs, an ugly but egg-laying species of Malay fowls, which Mr. Turner has imported, and a few more with the cider-press; and then we sallied forth to the Beacon Down clover ley, at the highest point of the farm. The majority of the 200 stock ewes were there, with a "dainty quene" in the shape of a four-shear of Burgess, and Dodford blood, and the dam to boot, of a rare shearing by the Carlisle tup, which has left good evidence of his season's sojourn. "A crop above and a crop below" is the rule here, and the two-acre orchard full of red and white "Clusters," almost ripe for the cider-press, gave signs of nearly forty hogsheds that autumn. The same amount of acreage has been known to produce its eighty hogsheds, and of recent years, 1859 has been the best. There are at least 100 different sorts of cider apples, Hang-downs, Bittersweets, Ducks'-bills, Queen-apples, Pigs'-noses, and we know not what besides, but Mr. Turner, after trying about forty of them, gives the "Clusters" a most decided preference. To the left of this orchard, was the mill meadow; but the mill has become a myth, and two couple of unyoked oxen, busy with their mid-day bundle of grass, were the only tenants of it. If the objects beneath us were rather tame, we had only to sweep the horizon all round from the north-west, to get an ever-varying panorama of South Devon. A sort of fir glen was the green link between the Whitestone Hills and Cadbury Castle, near which Fairfax encamped his army; and then nestling as it were beneath the distant range of the Tiverton Hills, stood the fair city of Exeter, which Follett and Philpott have placed "for all time in the mouths of men" who love law and polemics. The pleasant valley of the Clywst conjures up much more rural images, both of Lord Poltimore, whose hounds and horn are heard season after season in its covers, and that time-honoured type of an English Baronet Sir Thomas Acland. Sidmouth Gap reveals the secret of the Southern seaboard, as it sweeps away to Exmouth, and then is suddenly lost behind the undulating grounds of Peamore, the seat of Mr. Keckewich, M.P., which make up a richly-wooded fore-ground of beech, oak, and sycamore. Mamhead seems to skirt the Southern coast once more in the distance, and then the bleak, flinty outline of hill with only one feature to break it, in the shape of a grand-stand (which, thanks to Sir Lydston Newman, has been peopled once more after a twenty years' silence), is lost among the stately woods and towers of Haldon, under whose owner, Sir Lawrence Palk, M.P., the farm at Barton is held.

A riding circuit soon brought us among the herd in

the Winnard's meadow, where Olga (1524), of Passmore and Halse blood, was standing under an oak, ruminating, no doubt, on her future Cornwall home. She had been the highest cow lot (53 gs.) at the sale, and Lord Falmouth had also taken Cloth of Gold and Bloomer to bear her company. She was very level and true, and with capital shoulders; but her horn had not that peculiar double twist, which eleven years had conferred on Calistygia (57), by James Quartly's Prince of Wales, and going back to Silivant (120). The latter is the dam of Titania and Omar Pasha, which, after winning at Carlisle, crossed the Atlantic, each with 80 gs. on their heads, the one to Mr. Faile, of New York, and the other to Mr. Wainwright, who learnt his experience as a Barton pupil, and turns it to good account, in the Hudson-washed "meadows," near Rhinebeck. Piccolomini (1540), by the Paris prize bull Duke of Devon (34) from Mayflower (289), a granddaughter of Hundred Guinea, was there, looking none the worse of her recent journey, to take the first cow prize at Cork, and noticeable for her fine length on the top of the quarter. She has been a great bull breeder, and her prize Chester calf went to Australia at the Omer Pasha figure. There too was old Bountiful (545), of Mr. John Halse's breeding, hobnobbing with Stella, a daughter of The Zouave (556), and Clara Novello (1217), with two crosses of Earl of Exeter (38). Beeswing (1174), a two-year-old heifer, by Napoleon (257) from Olga, and the triple winner at Dorchester, Canterbury, and Cork, was lowering her salute from the opposite side of the hedge, where we found her with Zelica. Her head was hardly so sweet as some we had seen, but her flank, twist, and loin were especially good, and her wide walk behind lent her a most independent style as she moved. Zelica has a more lively style of head, but the white, which according to Devonshire canons of taste, is only allowable on the udder, makes her rather "sparky" beneath, and she is a trifle dipped in the loins. Before going back to the homestead, we climbed the meadow hill, and got among the sheep once more, to wit, three shearing tups, by one of Mr. Sanday's from Burgess's theaves, and a Holme Pierrepont three-shear from a Buckley ewe, with a most remarkable scrag and wool. Mr. Borton got him in 1859 by a 62-guinea bid, and Mr. Turner carried his point for 30 gs. in '60.

The house, with its white walls, and its sloping thatch roof, wears an ancestral grange aspect, quite in keeping with the primitive farm-yard. Shippens have improved so much, both externally and internally, with the times, that one hardly expects to see a great prize animal manufactory, with mud and rough-cast walls, and thatch, which has long since merged the yellow in the green. Such, however, we found it; but warmth is got, and "training" and calf-breeding prosper merrily together. Even the horns of a "bullock" (everything is "a bullock" here) had usurped the place of honour over the stable-door, and Honeysuckle (1404) by The Zouave, and inheriting his grand back and loins, was drawn up on parade in front of it. Then came Vaudine (1699), with the most lovely of fore-quarters, and as true as a die throughout, with the exception of a slight droop about the rump, the most trying point that Devon breeders have to contend with. Brilliant (1194), another daughter of The Zouave, was not long in satisfying us as to her splendid breast and forequarter; and anon bull after bull of all ages seemed to issue from cunning nooks. The two-year-old Prince Frederick (494) by Australian (365), with his beautiful curly coat and level frame, and well-ribbed loin, came first. His head has none of the Roman character of his grandsire Napoleon's, but is rather dished, with a most expressive and prominent muzzle. In this point his son Great

Western had taken much more after his dam Vaudine, who has since, we hear, improved upon him with her Van Tromp. The herd is now very full of Frederick heifers, including Beeswax from Beeswing, Cornucopia from Bountiful, Ruby from Prize, and Catherine Hayes and Songstress (both Oaks-winning names) from Clara Novello; but we only saw C. H., which was a trifle deficient in length, and Lady Devon by Napoleon from Lady, very fine in the bone, and most ladylike throughout. As

an appropriate closing scene, we peeped at old Lady, or rather the wreck of her, after her return from a Cornwall visit to a Quarterly-bred bull, but she has not proved in calf. Palmerston (477), the sire of Vaudine, claims her for his dam, and so does Prince Frederick; and it just seems doubtful whether she will live to see the change of the herd next September from Barton to Great Bowly, where Mr. Turner's own farm lies.

M. H. D.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

At a Weekly Council on the 27th Feb., Mr. Thomas Raymond Barker, V.P., in the chair, the names of candidates for election were read. Attention was called by a member to the following extract from the *Chester Courant* of Feb. 27, 1861:

"A Remedy for the Potato Disease.—The following letter to the editor of a Bristol paper is worthy of notice: I beg to draw the attention of the public to one of the most effectual remedies for preservation of the potato from the annual visitation of the disease. In all affected potatoes, even before the disease is visible to the naked eye, there is to be found a degree of moisture very far in excess of that to be met with in sound potatoes; and this watery principle gradually increases until the disease itself makes its appearance, when the character of the potato is changed, and the transition from comparative soundness to complete rottenness is sometimes the work of a day, but oftener the doings of an hour. Cultivators are indebted to Professor Bollman, of St. Petersburg, for the accidental discovery of a remedy, which has been found to answer so well in Russia, that on many estates drying houses have been built for the purpose of carrying out the experiment; and as it has been in operation in that country since 1853, it has consequently undergone seven years' trial. In the autumn of 1855 (1852?) Professor Bollman received from a friend—a colonel in the Russian army stationed in Siberia—a sample of a new Potato, with which he received two recommendations, namely, good in quality, and a perfect hundred-fold in produce. These potatoes were accidentally placed on the back of a stove used for heating the Professor's study, where, by some mischance, they were forgotten till the planting season arrived. When discovered they were shrivelled so much that fears were entertained they would not grow at all. However, the potatoes were planted, and flourished to such a degree that the two recommendations before mentioned were pronounced to be verified; and what was more remarkable still, although all the potatoes in the neighbourhood, and throughout the country, were more or less affected by disease, every potato of the new kind was entirely free from the disorder. This induced the Professor to adopt the expedient of drying; and, in consequence, the entire produce was submitted (after being dug) to a high temperature, which had the effect of charring some of the potatoes, and shrivelling the rest. It was surmised, at the time, that some of the charred potatoes were killed. They were, nevertheless, planted at the proper season; and the charred potatoes grew, and did quite as well as those potatoes which were merely shrivelled. The year 1855 also proved that, although the disease was generally distributed throughout the country, not one of the Professor's new potatoes was affected by it in the least. The experiment was again repeated in 1856; and the crop exhibited the same freedom from disease. The kinds mostly in cultivation were then operated on—sorts which were yearly more or less affected by the disease—still with the same result. The digging time of 1857 produced a splendid crop of potatoes. Upwards of three acres were planted with kilndried potatoes; and, although the produce exceeded 1,600 bushels, not a diseased potato was discovered. In 1858 Professor Bollman erected a drying-house, with heated floors, on his estate; and within the past two years similar erections have taken place on the different estates of the principal landed proprietors. It is gratifying to find that the action of the shrivelling process on potatoes already diseased arrests the progress of infection and

kills the disease, thus leaving a portion of the potatoes sound enough to be eligible for spring planting. It has been stated that by the constant raising of new varieties from seed, for planting, the disease may be considerably diminished; and this proved to be the case with the Fluke Kidney; for the first two years after it was introduced, and even after its cultivation had become pretty general, this famous Kidney had not been attacked by disease; but last year the Fluke had been in some instances as badly diseased as the Fortyfold, Regents, &c.; so that the process of kiln-drying promises far greater advantages and more certain results than all the expedients put together which have from time to time offered for the consideration of the public.—I am, sir, your obedient servant,

"R. MILES."

The Council then adjourned to its Monthly Meeting on the 6th March.

MONTHLY COUNCIL, Wednesday, March 6th. Present.—The Earl of Powis, President, in the Chair; Lord Berners, Lord Feversham, Lord Tredegar, Lord Walsingham, The Hon. Col. Hood, Sir E. C. Kerrison, Bart., Mr. Amos, Mr. Raymond Barker, Mr. Barnett, Mr. Bramston, M.P., Mr. Caldwell, Colonel Challoner, Mr. Druce, Mr. Frere, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Wren Hoskins, Mr. Howard, Mr. Hutton, Mr. Jonas, Mr. Shuttleworth, Professor Simonds, Mr. Slaney, M.P., Mr. Banks Stanhope, M.P., Mr. Thompson, M.P., Dr. Voelcker, and Mr. Owen Wallis.

The following new Members were elected:—

Atkins, Alfred, Farnham, Slough, Bucks.
 Badcock, Philip, 18, London-street, Cambridge-terrace, W.
 Blake, Wm. Bridge, South Petherton, Somerset.
 Broughton, John, Alington Hall, Market Drayton,
 Brown, Thos., Marham, Norfolk.
 Burt, J. B., Kettering.
 Crompton, George, Chesterfield.
 Crump, G. William, Woolas Hill, Eckinton, Pershore.
 Denon, Samuel, Picton Hall, Chester.
 Greenwood, J., M.P., Swarcliffe Hall, Ripley.
 Haig, James R., Highfield Park, Witham, Sussex.
 Harewood, Earl of, Harewood House, Leeds.
 Hornoyd, J. B., Blakemore Park, Upton-on-Severn.
 Kitson, James, Leeds.
 Linker, Peter, Norton Hill, Preston Brook, Cheshire.
 Mayer, Smith, Newcastle, Staffordshire.
 Musgrave, Rev. Vernon, Mattery, Bawtry.
 Nevill, Viscount, Hope Hall, Tadcaster.
 New, Richard, Hartpur, Gloucester.
 Rider, Joseph, Leeds.
 Stead, Titus Bennett, Leeds.
 Varnell, G. W., R. V. College, Camden Town, N.W.
 Welch, Henry T., Leek Hall, Kirkby Lonsdale.

On the proposal of Mr. Fisher Hobbs, seconded by Lord Feversham, Mr. William Sanday, of Holme-Pierrepont, Notts, was unanimously elected a Member of Council in the room of Mr. Kinder deceased.

FINANCES.—The Hon. Col. Hood presented the report, from which it appeared that the Secretary's receipts during the past month had been examined by

Messrs. Quilter and Ball found correct. The balance in the bank on the 28th ult. was 3,507l. 4s. 4d. It was recommended that in future, on the proposal of any person to be a member of the Society, a form of letter shall be sent by the Secretary to the Candidate, requiring his signature and an acknowledgment of his liability, which he must return to the Secretary before his election can be proceeded with. The Committee had consulted with the Solicitors to the Society on the expediency of summoning Members in arrears of their Subscriptions two years and upwards, and were about to issue a final letter to all defaulters, commencing with the metropolitan counties, in the following form:—

"SIR,—The Council having had under consideration the subject of arrears of Subscription, consider they are bound in justice to the Society to require these arrears to be forthwith paid up. I am therefore instructed to draw your attention to the applications that have already been made to you for payment of the arrears for the past — years, amounting to £ —, due from you. I would also direct your attention to the opinion of eminent Counsel which has been communicated to you, clearly pointing out your legal liability to pay that amount. Unless that sum be paid at this office, or remitted to me by Banker's Check or Post-office Order on Vere-street by the 30th inst., I am directed to hand over your name to the Solicitors of the Society, with a view of taking legal proceedings to enforce payment.—I am, Sir, your obedient Servant,

"H. HALL DARE, Secretary."

This Report was adopted.

IMPLEMENT COMMITTEE.—Colonel Challoner presented the following report, which was adopted:

That in order to give the public a better opportunity of inspecting the agricultural machinery exhibited at the County Meeting, the following regulations shall be observed:

1. That the stands for all implements belonging to the following divisions, namely,

1ST, THE TILLAGE AND DRAINAGE OF THE SOIL:

Ploughs and fittings, and parts thereof,
Harrows, and parts thereof,
Cultivators, and parts thereof,
Clod-crushers, and parts thereof,
Rollers, and parts thereof,
Whippetrees, and parts thereof,
Steam-ploughs, and parts thereof,
Potato-diggers, and parts thereof;

2ND, THE CULTIVATION AND HARVESTING OF CROPS:

Drills, and parts thereof,
Manure distributors, and parts thereof,
Horse-hoes, and parts thereof,
Hay machines, and parts thereof,
Mowing machines, and parts thereof,
Reaping machines, and parts thereof,
Horse-rakes, and parts thereof,
Carts and waggons, and parts thereof,
Dibbling machines, and parts thereof,
Weed extirpators, and parts thereof,
Liquid manure carts, and parts thereof,
Farm railways, and parts thereof;

3RD, THE PREPARATION OF GRAIN FOR MARKET AND FOOD FOR CATTLE:

Steam engines, and parts thereof,
Thrashing machines, and parts thereof,
Dressing machines, and parts thereof,
Barley hummellers, and parts thereof,
Chaff-cutters, and parts thereof,
Mills, and parts thereof,
Cake-breakers, and parts thereof,
Straw-elevators, and parts thereof,
Corn screens and riddles, and parts thereof,
Horse-gears, and parts thereof,
Gorse machines, and parts thereof,
Root-washers, and parts thereof,
Turnip cutters and pulpers, and parts thereof,
Steaming apparatus, and parts thereof,

Sack holders and barrows, and parts thereof,
Weighing machines, and parts thereof,
Thatch machines, and parts thereof,
Straw twisters, and parts thereof,

be allotted in a part of the yard separate from the miscellaneous articles.

II. That any exhibitor wishing to show implements belonging to both these classes and also miscellaneous articles shall have two separate stands.

III. That the certificate sent in by the 1st of May shall specify to which division the articles intended to be sent will belong, and, if some to both, the number of feet standing room required in each division.

IV. That the specifications be classified according to the above division.

V. That Mr. Brandreth Gibbs be requested to adapt the certificate forms and specification sheets to suit the above arrangements.

GENERAL LEEDS COMMITTEE.—The plan for a siding from the railway to the Show Yard proposed by the Mayor of Leeds was recommended, subject to approval by the Director of the Show; the gradient not exceeding one in 60. The great companies had agreed to use this siding.

The preliminary plan of the Show Yard on the same scale as at Warwick had been approved, and the Hon. Director had been requested to put up seats for the accommodation of visitors.

The Secretary was authorized to communicate with the railway authorities respecting the transport of live stock and implements to Leeds.

On the proposal of Mr. Brandreth Gibbs, seconded by Lord Feversham, it was unanimously resolved that the name of Mr. John Gott, of Armley House, near Leeds, be added to the list of this Committee.

A letter was received from the Secretary to the Commissioners for the International Exhibition of 1862, requesting the President of the Society to allow his name to be added to the list of those who had already signified their readiness to assist in the promotion of the object for which they were incorporated, which His Lordship, at the request of the Council, expressed his willingness to do.

The Consul-General of Denmark addressed a communication to the Society, informing them that the Agricultural Society of Denmark will hold their eighth meeting from the 2nd to the 6th of July next at Horsens, in Jutland, and intend to arrange for the exhibition of machines and instruments used in agriculture, horticulture, fishing, forests, plantations, &c., as was done at Gothenburg last year, being desirous of showing the progress made in Denmark during the period which had elapsed. The mode of transport of machines, utensils, models, and designs will be communicated to intending exhibitors by the Danish Consul-General on application at 6, Warnford Court, London, E.C.

On the motion of the President, it was resolved that the Monthly Council in April be held on Wednesday the 10th of April, in consequence of the first Wednesday in the month falling in Easter week.

Leave of absence was granted to the Secretary for a week at Easter.

The Council then adjourned to its weekly meeting on the 13th March.

WEEKLY COUNCIL, Wednesday, March 13, Mr. Thos. Raymond Barker, V.P., in the chair.

The names of candidates for election were read.

The successful Essay in Class IX., for 1859, was announced to have been written by Professor Tanner, of Queen's College, Birmingham, on the Breeding of Farm Stock.

In Class VIII., for 1859, the Essays sent in were not considered by the Judges worthy of the prize.

A letter was read, on the Culture of Mangel-Wurzel, from Messrs. Hardy, of Maldon.

The Council then adjourned to Wednesday, the 20th March.

Weekly Council, Wednesday, March 20, the Right Hon. Lord Berners in the chair.

The names of candidates for election were read.

A letter from Mr. Williams, of Chester, inclosing the following extract from the *Chester Courant*, of the 19th March, was read, in which the writer stated as the result of his observations in Anglesey, that those parts of Potato fields where there are most weeds, such as Grass, Chickweed, and the like, suffer least from the disease; that the haulm decays many weeks earlier than it used to do before the disease came in, and the young tubers thus deprived of their natural shelter from the sun may profit by the protection given them by the weeds:—

Some weeks ago we published a letter on the Potato disease which had appeared in a Bristol paper. It set forth that a Professor Bollman, in Russia, had accidentally made the discovery, seven years ago, that the disease could be prevented, and the produce greatly increased by drying—nay, almost roasting the seed Potatoes before planting; and that the Professor had continued the practice with the greatest success up to the present time. We append to-day another letter from the same quarter, which has been published in a Bristol newspaper, to which we beg the attention of our agricultural readers. The philosophy of it may be right, or it may be wrong; and it scarcely matters which, if the facts are borne out. It is very easy for anyone to ascertain for himself how much roasting a Potato will endure without destroying its vitality as a seed-set. Roast a dozen Potatoes, some more, some less; and, if you plant them in a hot-bed, you will learn in a very few days how far you may go with those that you mean to try in the open ground. The trial is so easily made, and the subject is of such incalculable importance, that we hope many of our friends will try it, so that the effect may be ascertained under different circumstances and in different soils. We have reason to believe that the Royal Agricultural Society will not be idle in this matter, but will try to obtain information from Russia in a more satisfactory form than what has as yet reached us.

THE REMEDY FOR THE POTATO DISEASE.—In answer to numerous letters desiring information as to the best time

for kiln-drying potatoes, and as the planting season of this important esculent will soon be here, I beg to inform those who are desirous of giving the experiment a fair trial, that, according to the practice of Professor Bollman, the operation was performed as soon after digging-time as it happened to be convenient, and that the potatoes were dried in single layers on a heated floor, the temperature of which was gradually increased to the maximum of 140° Fahrenheit. After being submitted altogether 24 hours to this process, the tubers will be dry enough to be replaced by a fresh supply, which of course will have to be repeated until the whole stock of seed potatoes have been heated in a similar manner. The seed may afterwards be stored in sacks or bins, or disposed of in heaps on the floor of a dry loft. For the convenience of cottagers and others whose stock of seed potatoes may happen to be small, the common oven will answer the same purpose. It is now a well-established fact in vegetable physiology that tuberous-rooted plants especially perform the functions of suction after the stalks have died away, and the roots to outward appearance are fully ripe. In the case of late potatoes, therefore, the deposition of the organic matter cannot be reckoned to begin until the first week in November, and as this most important process in most vegetable structures is not completed until the end of January, we may safely determine the latter period to be the best time for kiln-drying the potatoes. Again, early potatoes should be dried in the same way any time between the middle and end of October. Let the process be carried out according to the rules here laid down, and the manner of the operation will be found to be in harmony with the revelations of botanical science. Besides, the cultivator should never lose sight of the fact that the potato loses nothing but moisture by drying, and seeds are not considered saleable until carefully dried. One of the causes of the disease is thus removed before planting. It often happens that seed potatoes have to be spritted at least once before planting, an operation which afterwards greatly impoverishes the crop.

A collection of agricultural implements, manufactured in Montreal, many of which appear to be of excellent construction and remarkably cheap, was presented by His Grace the Duke of Newcastle, Secretary of State for the Colonies, by whom they had been brought home from Canada.

The Council then adjourned over Passion and Easter weeks to the monthly meeting on the 10th of April.

WHAT IS TO BE DONE WITH THE THIN WINTER CROPS?

Perhaps we have never had such a number of thin and defective winter crops, within the memory of the oldest farmer, as in the present winter. Wheats on all heavy lands are very patchy and backward, in many cases far too thin of plant, and in others nearly devoid of plant altogether. On the lighter soils for the most part they look rather promising, although backward. Tares are also very defective in plant, and what of them can be seen look very brown and unhealthy. Turnip-need crops, owing to an abundant covering of snow, have escaped far better than could have been expected; still they look unpromising. Winter beans do not exhibit any favourable prospect, and the breadth sown is limited, owing to the past late season. Rye, from the like cause, is a limited crop, and not a very hopeful one. Cabbages for early spring setting are in a better state, but require much attention in planting; they are stunted in growth and very short in stalk, so that a very small hole will suffice for their reception. Lucerne, sainfoin seeds, and clovers have escaped exceedingly well, and will require no further remark than this: the seed and clovers should on light lands be rolled at a suitable time, so as to compress the soil so much loosened

by the frost, and fasten the plant. I think the above are the principal winter crops to which it is desirable to advert.

The thin Wheat Crops.—I am afraid these thin crops are very numerous in almost every district. On strong loams, clays, and badly-drained lands, they are general; the exception being a fair plant, of which very few are to be found. What, then, is to be done with these defective crops? It is difficult to say. The experience and judgment of the farmer, aided by the best advice he can command, will be the safest guide. No one can say what course ought to be pursued in any case, except upon actual inspection, and carefully weighing the respective changes of ultimate benefit from any suggested procedure. I can merely give some outlines or suggestions by which to guide to a decision. Take the wheat crop: If the plant is thin and backward, but distributed with tolerable regularity over the field, I should say let it stand by all means, and take the earliest opportunity to improve it, and in this way: If the land is fertile or in high condition, let the crop be eaten off with sheep, the larger the flock the better, and well trodden down in the shortest time possible, when the land is dry and the

weather is suitable; this to be followed by rather deep hoeing as soon as the plants are fairly up again, which with one or two harrowings will generally thicken the plant surprisingly, particularly if the variety of wheat is subject to tillering. If the soil is weak and requires every aid, the best course is to roll and hoe early, so as to encourage the growth as much as possible; and then, when the blade is sufficiently forward, apply a top-dressing of manure—i. e., soot, nitrate of soda, guano, or other of our many and approved concentrated manures—taking care to have the manures reduced to dust, and sown in showery weather early in the morning, upon heavy dews. *But in a great many cases there is no plant at all.* The farmers must, for the most part, then be ruled by circumstances. On some rich soils it may answer to plough up and work the land for potatoes; in others, simply to plough up and sow spring cropping—beans, peas, barley, or oats—depending upon the crop which preceded the wheat plant, always avoiding a return to the same crop. If the wheat succeeded beans or peas, I should prefer oats or barley; if after oats, I should prefer the pulse crop. If in the judgment of the farmer neither of these crops would be desirable or meet his views, he could readily resort to the bearded spring wheat, which may be put in as late as 1st of May with safety. At all events, the land must not lie dormant; if one plan fails, another must be tried. The season, after all the farmer's efforts, may frustrate his purposes. He must then aim to produce a root or cabbage crop, and generally the cabbage crop is to be preferred in precarious cases; the plant can be grown strongly, and if the farmer is watchful and prompt he may generally secure a good planting. Coleseed is the next safest crop in difficult cases, and the sowing can if necessary be deferred to late in July, when with superphosphate or other good artificial manure a good crop may be secured. Turnips require a better preparation than either of the above, but the crop does not often excel either. I would say that, with judgment, promptitude, and care, most of our thin crops may thus be made profitable, and at no very great expense or much extra trouble.

Tares.—In every defective crop of winter tares required for grazing, the best course is to fill up with white mustard. This may be advantageously done by watching the season; and on a suitable dry day sow, at the rate of from ten to twelve pounds of seed per acre, upon all places requiring a renewal, and harrow it in, so as to obtain a reasonable covering. If the soil is sodden or stiff, or waxy, the farmer must wait as long as his judgment can permit him; and then, if no change occurs in the condition of the soil, to suit it for the reception of mustardseed, he will have to plough it up for a root or coleseed crop. White mustard grows rapidly, when once fairly up. Bones or superphosphate aid its progress wonderfully. It should not be stocked before attaining a reasonable growth—i. e., nearly a foot in height. It constitutes a safe and nutritious food for store sheep.

The Turnipseed Crop.—This must be filled up as

well as possible by fresh and good sound bulbs: seed is of no use. If no fresh bulbs are to be had, then, after or before the first hoeing, sow the thin parts with turnipseed. This will frequently provide a fair crop of turnips, after the seed crop is reaped. Should, however, the crop be so thin as to evidence a considerable failure in the seed crop, it will be a case for serious consideration as to the propriety of ploughing it up and substituting a spring crop. Thin seed crops of these kinds are so seriously injured by wind and weather, as generally to make them unprofitable. Far better to substitute another crop, than take the risk.

Winter Beans.—There is little to be done, if the soil is stiff and close at top; but if open and free, possibly dibbling a fair quantity in afresh may do good, or deep hoeing, and then the dibbling might proceed. The spring variety should be chosen for this filling up. If the plant is really a doubtful or hazardous one, do not hesitate. Up with it, and sow the spring beans. Half-crops are always unprofitable: at all events, aim to have a full one. The land would be in a better state to produce a full crop, than if only recently ploughed from the harvest crop.

Rye.—There is now so little grown, that it is almost superfluous to allude to it. Where it is sown for early spring grazing, nothing can be done to advantage in improving it. If it is to be of any use at all, it is wanted before any plant can be made to grow to any extent. The best aids this way are in white mustard or barley, well harrowed in. Spring tares would answer very well, if the grazing can be prolonged to July before ploughing up.

Cabbage.—This is becoming a more important spring crop than formerly. Mangolds are now so freely grown, and so well harvested, that they form the principal spring food for cattle and sheep. The farmer has to look out for a continuous supply, when this fails; and one of his best resorts is to cabbage. For this purpose he requires a large breadth of cabbage plants to be set in the autumn, and a considerable number in beds, for early spring planting. Those planted in the autumn will simply require filling up with fresh plants from the beds. The substitute for any failure of the cabbage-plant beds must be made up by sowing coleseed on the land intended for cabbage. It is subject to mildew, when sown out of season; but it produces much food.

N.B.—I omitted to say in my paper of last week, on planting potatoes, that I wished strongly to recommend the selection of any tubers known to be free from disease, and to plant them separately, so as to avoid any contact with diseased varieties, and on soil, if possible, untainted by it; and from this stock to provide the future seed. The Flukes, which were free three years ago, are sadly diseased now. Is this owing to carelessness? Occasionally, we find a fresh introduction of a variety; that it will be tolerably free, for the season; but, by some cause or other, it is soon bad enough. Would careful selection of the clearest tubers prolong their safety? Such simple means can be adopted, and may prove advantageous.

HOW TO TAKE THE CENSUS.

The decennial enumeration of the inhabitants of the United Kingdom is to be made next month, and it is to be desired that the census to be taken should comprehend, not merely the names, ages, nativities, and occupations of the people, but also returns of the lands in crop, live-stock, and products of industry generally, in

the British Isles. It is by no means creditable to a kingdom which prizes itself for its skilful agriculture and grazing success that there should be no collective data whatever to mark its actual position and progress, while many of its colonies and petty European States can point with satisfaction to the elaborate returns and

agricultural statistics obtained too under many disadvantages, but still forming admirable data for comparison. On many previous occasions we have pointed to the unanswerable fact that what has been well done in Scotland and Ireland could also be advantageously followed out in principle in England and Wales.

Through the labours of the Board of Trade—which takes cognizance of all imports and exports, the quantity and movements of shipping, railway, and factory statistics—we obtain information of great advantage to those who desire to comprehend the condition and prospects of the country; but this knowledge is comparatively of little worth without that which can alone be derived from an accurate census. A knowledge of the commercial and natural wealth of a country is important in connection with an estimate of its inhabitants: and certainly the condition of agriculture can never with any propriety be overlooked, especially when, as in Great Britain, it forms so large a proportion of the wealth and stability of the nation.

Without overlaying the return by tedious and unnecessary inquiries—useful, no doubt, but impossible to ascertain generally with any degree of precision—there are several heads of investigation to which attention might be usefully directed, and with better prospect of success. No doubt some of the interrogatories we desire to see answered have been adopted by the Census Commissioners. As an instance of the minuteness with which the last American census was attempted to be carried out, we may state that the interrogatories prepared and approved by the Advisory Board of Agriculture for the Commissioners of Patents numbered no less than 1,710, to be filled out as far as practicable for each farm, &c. Some of these questions are almost frivolous in their character, and many troublesome and unimportant. We may enumerate, however, the general heads of inquiry, beyond which our space will not permit us to go. Classification and value of land; leases; agricultural labours; improvement of land by drainage, irrigation, fertilizers, and rotation of crops; bread crops and culinary plants; fruits, nuts, and wine; forage crops; textile and other staple crops; forest culture; animals and their products; agricultural implements and machines. These subjects necessarily embrace a wide field of inquiry. Many of them are highly interesting to statisticians and others engaged in the investigation of our progress and future well being. But to attempt to obtain anything like complete returns on all these heads would be utterly impossible with the arrangements and machinery to be employed for the forthcoming census. Still we do hope to see a small body of facts collected which shall set at rest many debateable points. It is, for instance, especially desirable to know what is the extent of land under culture with various crops. With our marine boundaries we know the area cannot change; our geographical information as to the British Isles is accurate enough. But we want something more on the present occasion than the mere "nativity, ages, and occupations of the people." We ought to know the number of the live stock, the progress of cultivation,

and how far towns and building operations have trenchanted upon the cultivatable land of the country; what waste-land has been reclaimed; what are the chief crops in different localities. Who can tell, for instance, how many acres are devoted to potatoes, flax, and chicory, and how much forest or timber there is left in the kingdom? The question is continually mooted as to what influence railways have had upon the employment of horses; and what data have we to estimate correctly their number? So with cattle and pigs, how desirable would some statistical details of the quantity owned be. With sheep, again; the most vague estimates are propounded from time to time as to the total number in the kingdom, and it is hence impossible to ascertain what is the yield of British wool.

These, and many other points to be ascertained with very little trouble, might with great propriety be prosecuted with the census enumeration. Even an estimate of the number or value of the steam-engines, agricultural implements and carts, employed, would be exceedingly useful.

We do not advocate the collection of these statistical details for the mere object of ascertaining how much grain, or potatoes, or forage is grown, to guide speculators, or influence the markets; but we do think that justice to the agricultural interest demands that the aggregate results of their enterprise, outlay, and industry should be placed in their proper light. Because we have no means of judging of the produce of our cultivation, and the progress it has made to supply the increasing wants of the people, we are apt to look upon it in a secondary light. The progress of our metallic industries and of our textile manufactures are paraded month by month in diffuse trade circulars, and in the Board of Trade returns we find long rows of figures representing enormous amounts of linens, woollens, calicoes, and iron manufactures exported, and of the tea, and wine, and cotton, imported; but the public has no means of calculating what our agriculturists produce, and how much they are indebted to them for food and clothing, and many other of the every-day wants of life.

There are many features of agricultural progress and social benefits resulting therefrom, which statistical returns cannot embrace, but that ought not to be lost sight of by the community. Among these are the benefits which agricultural science combined with practice has effected in economic zoology, botany, geology, and meteorology.—In rural economy, embracing landscape gardening, drainage, enclosures, country residences, and farm buildings.—In mechanical sciences by the more extended adoption of steam power and improved machinery for various purposes.—And, lastly, in political economy, embracing the public encouragement and extension of agriculture, and rural economy, internal improvements, disposal of town refuse or sewage, public hygiene, agricultural education, agricultural societies and clubs, agricultural insurance and mutual protection, employment of agricultural capital, support and employment of the poor, and diminution of pauperism. All these, if duly weighed and considered, would place the agricultural interest in its due position as regards the industry of this kingdom; and the value of the land, stock, implements, produce, labour, and capital employed, if aggregately estimated, would take high rank among any of the occupations of the people.

ON THE RE-FORMATION AND RE-CONSTRUCTION OF FENCES ON THE TILLAGE FARM.

THE SIZE AND FORM OF FIELD MOST SUITABLE TO THE ECONOMIC USE OF STEAM-POWER,
STATIONARY OR LOCOMOTIVE, DEMONSTRATED.

Within the last few years various able and instructive disquisitions have been presented to the agricultural public, demonstrative both of the practicability and the economy of steam as a motive power in the traction of tillage implements, in place of animal strength. In all these, however, the fitness of the land for the thrifty appliance of this agency, as respects the laying out of the fields, has been assumed. Indeed, in all the instances on which the arguments in favour of this proposed substitution are based, the circumstances of the experimental areas were sufficiently well-adapted for a fair trial and exhibition of the power of steam as an agent in field cultivation; and hitherto no special attention has been directed on the unpropitious statistical fact, that a vast majority of the existing tillage enclosures of England are all but absolutely disqualified, by reason of inadequate size and irregular form, for the reception of steam agency in their culture. In a former paper, we set forth reasons showing that to obtain the fullest amount of work out of the animals labouring in the tillage field, the enclosure ought to approach in form, as near as circumstances will allow, to that of a parallelogram or oblong, whose greater axis crosses the strike of the furrows at or near a right-angle, and to contain an area not greatly under nor much above twenty-five square acres. It was added, in concluding the argument, that this specification of shape and magnitude was in substantial accordance with the practical principles on which the use of steam as a motive power in working the soil can to best advantage be employed.

This assertion we will now proceed to verify; premising first, that when the various mechanical plans proposed for carrying out steam-tillage are examined and classified, they may be arranged thus: 1st, Into those in which the engine is absolutely stationary, whilst the process of cultivation is under its impulse, as in the Woolston method. Or where a minor amount of locomotion is given to the machine, as in Fowler's contrivance, in which a slow motion along the line of the head-ridge on which it is placed gives to the plough, furrow by furrow, its lateral progress across the field. In both of these inventions, the tillage implement, as is well-known, is dragged through the soil by means of differently arranged wire-ropes, which, as shown in the Woolston method, may be intermediately deflected from straight lines by means of pulleys or sheaves anchored in the ground, but which ultimately must be adjusted so as to draw the attached instrument in successive parallel and collateral straight lines, in like manner as is done in ordinary ploughing. In other words, although it is true, that the formation of bent ridges or

furrows, in order to run equidistant with all the deviations of an irregular fence, may be done by means of animal draught (but with a greater or less sacrifice of time and labour coequal with the greater or less amount of deflection), it is no less true that neither the Woolston nor Fowler's apparatus is capable of drawing the tillage implement itself in any direction save that of straight lines, from one end of the field to the other.

The second class of cultivating steam engines are essentially locomotive in their constitution, either dragging an attached implement of tillage in their train as in animal traction, and as exemplified in Boydell's well-known contrivance, or having rotary diggers constructed on the after-part of the machine itself, these being moved around their axis with greater or less speed contemporaneously with a slower forward motion of the entire apparatus effected by broad driving wheels acting on the surface of the ground. This is the principle of Rickett's patent.

The third and only other species of invention which it is necessary to allude to is Halkett's. Like the last class, it performs its work directly from the body of the machine, which simultaneously impels itself forward by means of driving wheels acting on light rails, each permanently embedded in the earth in the parting furrow between ridge and ridge.

Now, assuming, for the sake of argument, that all these mechanical contrivances generating motive power, and of communicating it to tillage instruments, possess equal economic value—although, in truth, this is a much vexed question—it will be found, in bestowing a little reflection on the subject, that all of them are liable to a greater or less loss or waste of power whilst in action, connected with and arising from the conformation of the field in which they may be at work. Thus Fowler's combination requires that a certain portion of its effective strength shall be employed in moving the engine itself and its appurtenances (including in the number of these the locomotive stay or anchor in the opposite headland), in order to advance the tillage instrument furrow by furrow across the field; and everyone who has studied dynamics but slightly, and possesses a moderate acquaintance with that part of Fowler's patent, will readily see that it involves a no inconsiderable amount of steam agency not available to the actual cultivation of the ground. Hence, then, in adjusting the shape and proportions of a field designed for steam culture on Fowler's plan, its proper form might, at first thought, be deemed to be that of a parallelogram, prolonged in the line of the ridges and narrow across, whereby the space over which the engine and anchor have to traverse would be reduced in a degree proportionate to the difference between the

length of furrow and breadth of field. But, on the other hand, the loss of power caused by the friction of the wire rope on the porters and soil is great in proportion to the length in use, a circumstance which, joined with a further loss of power by reason of weight and with greater expense in the prime cost, suggest an outline of field shorter along the ridges than across; and, on the whole, we apprehend that, as respects Fowler's arrangement, a form of enclosure which like that most adapted to the economic exhibition of animal power (that is longer across than along the ridges) must be resorted to. In our former paper demonstrating what, under ordinary circumstances, is the length of ridge best suited to the thrifty exhibition of animal power in tillage, an admeasurement of about 300 yards was proposed; and it is a satisfactory coincidence to find that this approximates with sufficient closeness to what may be called the *range* of Fowler's apparatus. To an eight-horse engine he attaches an endless rope of 700 yards, which, besides being doubled on itself when in use, has to be passed round the hauling windlass and the anchor pulley, and thus cannot possibly give the plough a much greater rectilinear motion backward and forward than 300 yards.

In the Woolston arrangement, operative circumstances present themselves differing considerably from those already noticed in relation to Fowler's rival patent. Here, as was before observed, the engine is absolutely stationary whilst giving forth its strength to drag the tillage apparatus connected with it. And, assuming that the reader is acquainted with the manner in which the rope tackle is laid out, he has only to be reminded that, while there is no *absolute* limitation in point of acreable surface which may be cultivated at a time without shifting the apparatus, yet, practically, the area cannot, consistently with economical results, exceed sixteen acres; and that, in order to cultivate any given piece of ground, the wire rope must, as an initiatory process, be extended in one or other of the four following parallelogramatic forms—namely, 1st, an equal-sided and right-angled square; or, 2nd, a right-angled oblong; or, 3rd, an equal-sided figure with unequal angles; or, lastly, an unequal-angled oblong. Now, according to the prospectuses issued of this, the Woolston method of steam cultivation, an eight-horse engine is represented as capable of working 1,400 yards of rope; and this entire length, extended out in an exact square, would, of course, invest an area of 350 yards a side, equal to twenty-five imperial acres. But, actually, the whole length of rope is not available for this purpose. On the contrary, no less than a fifth part must be always unextended on one of the windlasses, to allow of that reciprocal action of paying-out and hauling-in, which distinguishes the Woolston plan. Hence, then, the investing rope is thus reduced to 1,120, giving a square of only 280 yards on each side, and thereby reducing the maximum acreage which this apparatus can cultivate, at one laying-out, to 16 acres. Indeed, regulated by these circumstances, a field designed for Woolston steam tillage ought to be 280 yards from fence to fence in one direction, or within twenty yards of the typical

dimensions along the ridge already propounded. A square of 280 yards, however, gives a contained area of only sixteen acres, which in every point of view must be regarded as decidedly under size. Doubled, it would of course form an oblong 280×560 yards, and containing thirty-two acres—a shape and magnitude open to no objection whatever, even in respect of animal labour; and most suitable, as has already been shown, as regards the use of steam on the Woolston system; since the most economical adjustment of rope, in this invention, is an exact square, whose sides are each equal to one-fifth part of its entire length—that is, 280 yards a-side. Of course it will readily occur to the reader that in this case only 16 acres of the field could be worked up at a time, and that when the first part was completed the engine and other apparatus must be removed to and readjusted on the remaining portion. Here, then, again does the oblong form extending across the line of action of the motive-power present itself as the typical form best suited to economize labour, whether by means of animal agency, or of those two several adaptations of steam traction on which we have been expatiating.

But when the next class of engines, the *locomotives*, come to be considered, a set of operative elements come into play which seem to dictate an arrangement, in the form of field on which it is purposed to exert their power, the reverse of that already demonstrated as best adapted to non-locomotive contrivances. For, as respects the species of inventions to which we have now turned, it is to be remembered that, like the horse or ox, they accompany the implement used; and hence, (as in the exhibition of animal motive strength), there unavoidably must be a loss of time and power in the act of turning at the end of the furrow, greater or less in proportion to the weight of the apparatus and of its associated instrument of culture. From this circumstance it follows, therefore, that the frequency of putting about, ought in the case of the locomotives to be lessened by using ridges of extreme length; in other words, by forming fields long in the direction of the furrows, and comparatively narrow across them.

In this way the timid reformer may possibly conceive himself in some sort placed between the horns of a dilemma. To admit the use of steam as the motive agent in the prime operations of tillage in his corn-fields, he must remodel these; and yet the foregone experience of steam-culture has not hitherto unambiguously determined what shape or size is best suited to promote the thoroughly economic adaptation of this mighty flexible, and universal auxiliary to human industry. But were it prudent never to embark on any reformatory course until every doubt or uncertainty were removed from the onward path, improvement could never be initiated, for such discouragements to advancement and apologies for adherence to antiquated practices have ever existed, and never will cease out of the land.

But be his doubts what they may respecting the size of area or proportions along or across the strike of ridge, let the enterprising husbandman, in reforming his fences, entertain no hesitation or scruple in bringing the bound-

ing lines into quadrilateral parallelism; for most certain it is that every attempt to apply steam to the tillage of irregular enclosures will be lessened in its economic results in proportion to the degree of irregularity.

Thus, in this and in our previous paper we have deduced the principles which should guide the reformation of arable enclosures, whether the use of animal strength

in field-work is to be persevered in, or the impressment of steam as the motor be purposed. In our next essay, concluding the series, will be expressed the principles, both scientific and technical, which should guide the reconstruction of the modern fence, apart from what, for want of a more familiar term, may be called the *geodetical* principles already discussed.

NOTES ON NOVELTIES AT THE IMPLEMENT DEPARTMENT OF THE SMITHFIELD SHOW.

Comparatively little space will be required to place before our readers a notice of the novelties of the show of last Christmas month, these being, as stated in the first of our papers, few in number, and not very important in character.

In the department of steam cultural mechanism, in addition to the apparatus of Mr. Grafton, plans and models of that of Mr. Halkett were exhibited. The main part of Mr. Halkett's system is, as our readers doubtless recollect, the placing of a series of parallel lines of rails along the field to be cultivated; these rails supporting a large frame-work carrying the working implements. These rails are permanent, and are in consequence costly, not only in their original placing, but in the maintenance of their good working order. Mr. Grafton's system, as explained in our last paper, is designed to supersede the costly and cumbrous rails—in how efficient a manner experience has yet to show.

Passing over the department of machines and implements connected with the culture of the soil, as presenting but little of novelty, and that little having already been noticed in the columns of previous numbers of this journal, we proceed to notice other novelties connected with the "produce of the soil;" and in this, perhaps, the most suggestive was the corn-drying apparatus of Mr. Fourdriaier, of Grove-terrace, Peckham. We have said that this was the most suggestive of the novelties in this, or perhaps in any of the departments; and this so in view of what we may call, if not the disasters, at least the disorders, of last year's uncommonly wet and ungenial weather. It is impossible to overrate the importance of a means of drying corn in untoward seasons. Last year, if a cheap and easily-managed apparatus had been as accessible to farmers as it unfortunately was not, large amounts would have been saved in this country. It may not be here amiss to offer a few remarks in connection with this important subject.

The advantages obtainable by having the corn well dried—and here we refer especially to wheat as the grand staple of our people's food—are two-fold: first, it enables it to be kept; and secondly, it increases its bread-producing qualities. The following, in the words of a practical miller, will be interesting and useful: "Dried corn will yield much more flour per bushel, and require about half the machinery to manufacture it, that it otherwise does if not dried. The quality of the flour is improved at least 10 per cent., as by drying the

wheat all impurities of a vegetable nature are entirely consumed; and by extracting its natural moisture the flour will consume, when baked, more water than it would before the grain was dried, which makes the bread more palatable, it being more spongy." Any one who is at all conversant with the grinding of wheat into flour, knows well the additional cost occasioned by having damp wheat to work upon: the loss, as stated in the above extract, is 10 per cent.; of course it will vary in varying qualities; but as a rule, we should say, that this is the minimum loss, the average being greater. This year we had a sample to grind in a damp state; by artificially drying it, we estimated the extra work done at fully 40 per cent.

One of the most important features connected with wheat is the amount of water which it contains. This varies greatly according to climate, locality, and weather. Climate has a remarkable influence in the flour-giving qualities of wheat. Boussingault mentions that the wheats of the North of France are less valuable, and keep for a less time, than the hard horny wheats of the South, ripened under a brighter and fiercer sun. To keep well, the per-centage of moisture should not exceed 10 per cent.; some wheats, however, show as much as 16 per cent. Experiment has, indeed, shown a marked difference in flour-producing qualities, between a wheat grown in England and in Scotland; that grown in the former in a warmer district showing a higher yield than that grown in the colder. A London baker, making on a large scale, testifies to the fact that the American grain yields flour which takes up or absorbs 8 to 10 per cent. more of water than the English wheat. This is invariably plumper and finer-looking than the American wheat, which is almost always dried up and shrivelled in appearance. This is caused by the fiercer sun, which beats upon American corn, leaving its farina in a more condensed state, so that when again subjected to moisture it absorbs a larger per-centage of water in the process of baking—a point of no small importance, as any baker will explain to you. An addition of damp or extra wet grain thus brings about a double loss: it increases the liability to decay; and by diminishing the quantity of *gluten** renders the flour made from it unfit for good "panification" or bread-making.

* Dumas considers that the gluten only is affected by damp, it having no influence on the starch of wheat. Professor Beck dissents from this opinion, and for the following

Seeing, then, the influence which damp has upon the flour-producing qualities of wheat, it has for many years been an object of some importance with many, to introduce a ready and economical means of drying corn in the bulk. This object of course increases in importance with the badness of the season; so that a year like last has probably been more fertile in the invention of drying apparatus than any preceding one. The apparatus of Mr. Fourdrinier is one result of the increased attention which the untoward features of last year forced agriculturists to give to it.

The most generally adopted method of drying corn in the bulk is the old-fashioned "kiln." In this the grain to be dried is placed upon tiles or iron plates, these being perforated with holes, through which the heated air—from fires beneath—passes, and penetrates through the mass of grain placed above; the vapours arising being led off through a ventilator placed in the room above. A very brief consideration will suffice to show that this plan is anything but a perfect one. In the first place, it admits of no regulation either of the rate of speed at which, or the amount to which the corn shall be dried. It is clear that the lower layers lying next to or upon the perforated plates or tiles must be more thoroughly dried than the upper layers, which are not only less exposed to the direct heat of the plates, but are subjected to the *damping* influence of the mass of vapour which arises from the under layers. In fact, an examination of a mass of grain lying on an ordinary kiln-floor will show many layers in several conditions or stages of drying—a remarkable want of uniformity of condition. At least, we have found this to be generally, if not always the case. But these do not exhaust the defects of the kiln-drying plans: the holes in the tiles are apt to be stopped up with the grain, and the regulation of the intensity of the fires beneath is very difficult to be attained. This last difficulty brings about in some instances an over-drying of the grain—a source of loss as great almost as that incurred by its over-dampness.

Many of the defects of the kiln-mode of drying grain can be obviated by the plan of *forcing* currents of heated air through the mass by means of power. This, in fact, constitutes the plan introduced by Mr. Fourdrinier; and an exemplification of which he exhibited at the Smithfield Show (in the mews adjoining the Bazaar). The apparatus may be briefly described as a large waggon-

reasons: "Starch is known to be composed of particles which are insoluble in water; but when exposed to a heat of 180° Fahr., the pellicle of the grain bursts, and the contents are liberated. In a state of solution, it is quickly converted into dextrine and glucose, or grape sugar, by the addition of a small quantity of diastase (this diastase is a peculiar nitrogenous principle which exists in the grain of the cereal after germination ceases). If this mixture be kept in a warm place for a few days, it acquires a new property, viz., that of converting the glucose into lactic acid. This is denominated the '*lactic acid fermentation*,' and as I have before suggested, it is probably one of the causes of the souring of flour, when exposed to the high summer heats in its ordinary moist condition. Hence it will be found, that while in some flour the quantity of gluten is diminished, or its quality injured, the proportion of glucose and dextrine are also, in many cases, increased at the expense of the starch, a change which precedes the development of the lactic acid."

shaped box, like a railway salt-truck, provided with a waterproof covering. The grain lies in this on a false bottom of iron plates, perforated with apertures. A space is left between this and the real bottom, into which hot air is forced by means of a fan, worked by steam or hand-power. The air is heated by being forced in at one side of a stove, passing over hot plates therein placed, and out at the other side into a pipe which leads it to the space between the false and real bottom of the drying waggon. The apparatus is capable of drying 30 qrs. in a day. The work done will, however, depend upon the dampness of the grain and the degree to which it is to be dried. We have said that this apparatus gets rid of many of the defects of the old "kiln;" but not of all. The rate of speed of drying can be greatly under control certainly, by the regulation of the velocity of the fan which propels the current of heated-air. But there is a lack of means to ensure a uniformity of dryness without the use of the old, and we need not here say the imperfect implement, the shovel. However carefully used, the shovel is not adapted to turn over the grain well; besides, its use is apt to be altogether neglected, or, what is nearly as bad, given only at irregular times. Perfect uniformity in drying can only be obtained by having it continually in motion, while subjected to the action of currents of heated air. This motion can best be kept up by the aid of Archimedian screws, working within perforated tubes, and the tubes arranged in a chamber through which a current of heated air is continually passing. By having, as in the patented apparatus of Messrs. Davison and Horrocks (Mr. Davison of London-street, City), a series of ribs placed parallel to the axis of each screw, these ribs stretching at intervals between two adjacent threads, the grain in its passage through the tubes is lifted up, and consequently thrown over and well mixed. By this means the whole surfaces of all the grain are subjected to the action not only of the heated surface of the pipe, but to the hot air passing continually through them. By regulating, in an apparatus of this kind, first the speed of the revolving screws, and second that of the fanners forcing hot air into the pipe-chambers, not only the rate of speed at which the corn is dried, but also the uniformity of its drying, can be regulated to a nicety greater than by any other apparatus now in use.

We make no apology for the length of our remarks on this subject; its importance claims indeed a more lengthened treatment, which, unfortunately, our limits prevent us from giving.

"Prevention is better than cure," so says the old adage; and it is as true in matters agricultural as in remedial, political, or social. If by the use of improved mechanical arrangements corn *well cut* or hay *well saved* can be quickly stored, and put out of the reach of bad-weather influence, all necessity for the employment of a corn drier will be obviated. Of this time-and-labour-saving class of mechanism was the "hay and corn lift," the invention of and exhibited by Mr. White, of Missenden, Bucks. This consists of a "guy" or "shears," forming a tripod of three tall poles or spars, at the apex of which the necessary purchase or pulley-

gear is hung. The rope passed over this is brought down and passed over pulleys, the other end being fastened by a sling to the body of the cart: the long end of the rope is passed over a pulley, and pulled by a horse walking along, and the cart-body lifted off the axle, suspended in the air, and raised to any desired height, when its contents are taken off by the stack-builders, in the usual manner. Two of these lifts have been in use the last season at the "home farm" of His Royal Highness Prince Albert. A great saving of time is effected by their use. By the use of the lift, the rick or stack can be built of twice the usual height; and a rick of 40 or 50 loads can be built with the saving of the labour of three men. The time occupied in attaching the slings to and raising the load, is less than two minutes.

Amongst the minor novelties exhibited was one by a Frenchman, having for its object the sharpening of the edge of scythes, &c., or rather the maintenance of its smoothness and freedom from jags or wrinkles. This is effected by placing the edge of the scythe upon a small anvil, and subjecting it to a series of smart blows given by striking with a hammer a small "punch" above. The punch is provided with a spring, which gives the return movement, that is, lifts it quickly after the blow is given. We are inclined to doubt of the perfection of the cutting-edge thus given. The inventor is Mon. P. C. Ratel, of Paris; the London agents James Rutherford and Co., Ironmonger-lane, Cheap-side.

The improved smut or wheat-cleaning machine exhibited by Mr. Wm. R. Dell, 72, Mark-lane, London, deserves notice, from the compactness of its arrangements. It consists of a series of cylinders, kept together by flanges, the whole placed vertically within a neat frame, which is bolted down to the floor. The lower cylinder contains a revolving horizontal fan. The wheat to be cleansed, in entering the upper cylinder, passes over a corrugated iron plate, then between two cylinders of rough wire, and is finally subjected to the strong blast proceeding from the fan. Making 650 revolutions a minute, it is calculated to clean 5 to 6 qrs. per hour.

Mr. Braggins, of Banbury, exhibited his "combined and strap hinge." By this simple and ingenious invention, the hanging of a gate can be adjusted with great simplicity. The bolt which is passed through the vertical bar of the gate, and the end of which turns upon the swivel in the hind post, is screwed at its inner termination. This is connected with the strap which embraces the upper and vertical bars of the gate by a bolt, at the lower end of which is a nut, working with the screw of the bolt. By shortening or lengthening this, the gate can be raised or lowered.

In concluding our brief notice of the Smithfield Show, we may be permitted to refer once more to the subject of catalogues. Some two or three years ago, we made bold to devote a column or so in this journal to pointing out what we considered to be the defects of many of our implement catalogues, these deficiencies

having more particular reference to the vagueness of the descriptions of machines and implements—if, indeed, the term "description" was, in many cases, at all admissible, seeing that little or nothing of the peculiarities of the machine or implement was described. From this vagueness of general outline, as well as the absence of details, it is, indeed, very difficult to gain any idea of the nature of the machines illustrated in some of the catalogues. They present, in this respect, most marked contrasts to the clearly-drawn and explicit descriptions of machines and inventions which are brought out in the manufacturing districts.

In addition, moreover, to the lack of what *should be*, there is, in one or two instances we could point out, an unfortunate superabundance of what *should not be* in a catalogue—vague assertions, crudity of style, a remarkable indifference to—we do not say the graces—but the absolute requirements of good and correct composition. In this last respect, however, few sin. At the same time we see no reason why *all* our catalogues should not be drawn up in a comprehensively philosophic way, the machines and implements classified according to their uses, their illustrations so prepared, and their descriptions so drawn up, that their peculiarities of arrangement and construction could be at once noted by the reader. A series of catalogues thus prepared by the different manufacturers would be eminently useful, as affording trustworthy guides to the principles of arrangement as well as the points of construction of the whole range of our agricultural mechanism—a range so comprehensive and so diversified in its aims, that its judicious illustration and description is a matter of no small importance. We do not here advocate the doing-away with the present series of catalogues—as in certain points of business importance they are doubtless of great value—but we advocate the *supplementing* of these by others having claims to that completeness and fulness which the importance of the branch of mechanism which they are designed to illustrate most assuredly demands. For obvious reasons we do not point out the catalogues which fail in coming up to this standard; but the same reasons do not or should not influence us in pointing out those which do, or at least aim at reaching it. For excellence of mechanically-drawn illustrations we refer to a recent supplementary catalogue issued by Messrs. Richmond and Chandler, of Salford; and for a carefully-edited and well-written catalogue of known and approved implements, to that of Messrs. J. B. Brown, of 18, Cannon-street, City, London. These catalogues do not, however, quite come up to the standard we have in view; but they certainly have the merit—if merit it is—of approaching it more nearly than many others we could name. We are certainly ambitious to see the mechanism which our leading manufacturers have brought out at such a vast expenditure of time, skill, and money, illustrated and explained in the style to which its importance justly entitles it.

R. S. B.

ON THE SCIENCE, PRACTICE AND PROGRESS OF STEAM CULTURE.

Steam culture, since the Carlisle Meeting of the Royal Agricultural Society, has justly occupied a prominent place in the science of agriculture. Whether we turn to the publications of the Patent Office on this subject, to the columns of the agricultural press, or to the more interesting topic of successful practice in the field, ample evidence is found how the pioneers of progress are exerting all the energies they possess to supersede horses in the cultivation of land through the instrumentality of steam.

From whatever point of the compass steam culture is now viewed, science and practice declare the proposition fairly solved. Such being the fact, it is no longer the proposition itself that requires advocacy, but its progress. Experimental philosophy now acknowledges the proposition as part of applied science, and calls upon all practically interested to support the progress of discovery by every available means at their command, in order to effect the general adoption of the practice with the least possible delay.

Examined purely from a scientific point of view, the pioneering hand of discovery is busily engaged subdividing the subject into various lines of progression. It is proposed to yoke, for example, steam to the implement in various ways, and also to adopt different modes of culture, or of mechanically breaking up and subdividing the soil by means of different kinds of implements. Each of these lines of progression has much to commend it to notice, and nothing can be more imprudent on the part of the pen of an agricultural writer than to bridle discovery, as it were, and then prescribe for her only a limited length of tether, and from such data deduce premature conclusions in any of those lines of direction in which she proposes to move; for to her no boundary can be set. There are, it must be admitted, in every individual line of progression, certain principles that must be attended to. If the pioneering foot of discovery makes a false or wrong step, and runs counter to the established laws of science, they will soon, or at least eventually, teach her to retrace her steps, and advance in the right direction. A wrong step of this kind is subject to criticism; but great caution is always necessary in pronouncing a merit or in finding fault; otherwise, much injury to the cause of progress may be done. If, however, the wrong step is judiciously and scientifically pointed out, in a spirit friendly to progress, it will have a tendency to lead to further discovery in the right direction, and thereby advance the cause. "The child must creep before it runs;" and so must the "steam horse" in the cultivation of land, whatever may be the line of progression in which it is intended he should move.

From a practical point of view, the subject is not receiving the peculiar experimental investigation it so much merits. This arises, in no small degree, from the pecuniary circumstances with which the introduction of steam culture is surrounded. It takes a large sum of money on the part of inventors and implement makers to introduce a steam cultivator successfully to the notice of practical farmers, and no little extra capital on the part of the latter to yoke the same in their own fields. Generally speaking, a deficiency of capital is already experienced in agriculture,

and, although steam may be cheaper than horses eventually, yet before the change from the latter to the former can be made, some extra capital is required. Add to this the fact that those who have the command of an abundance of capital are acting a too penurious part relative to the claims which the subject has upon them, and the pecuniary conclusion is manifest. We readily admit there is a general willingness to patronize the subject; but in a too limited sense. In other words, only one line of progression is supported. Amid rival systems in the field, one is necessarily the best, or is pronounced the best under the circumstances of the case; and that one receives their approbation and patronage, and that one alone! It is the best system, and there cannot be two superlatives in the contest. Another system, because it is cheapest, suits a certain class, and is therefore the only one they can patronize, or hear discussed in a favourable light. Premature conclusions are thus hastily arrived at, and systems condemned without regard to the progress they have made or are capable of making by new discoveries and improvements, both in the implement and in the mode of working it.

The practical question, like the scientific, thus involves a two-fold consideration—the different systems of steam culture, abstractly speaking; and the amount of capital each requires to carry it out. This two-fold view of the subject can hardly in practice be separated or divided into the two elements of which it is composed, the practical value being inseparable from the commercial. It will be necessary, however, to examine each separately, in order to ascertain its individual merits—the rate of progress it is making, and the probability of further discovery and improvement.

Every system of steam culture should be examined in the light of its own individual merits. If it is carried out on certain specific principles, on those principles it stands or falls. Under horse culture, we do not examine the plough in the light of a harrow, or the harrow in the light of a scarifier. These implements are constructed on different principles, and perform works equally different as to principle, and in every case we endeavour to pronounce judgment in accordance with such principle. Under steam culture, experimental philosophy prescribes exactly the same rule for our guidance in every individual case or system.

The conduct of the Royal Agricultural Society of England has been highly reprehensible in this respect—all the different systems in the field known as Boydell's, Fiskens's, Smith's, Fowler's, Romaine's, &c., being judged not in the light of the different principles involved, but according to one of those "fireside-farming" rules peculiar to 12, Hanover-square. It were difficult to conceive anything more anomalous or at variance with our motto "Practice with Science," or calculated to sow the seeds of discontentment, and to check the progress of steam culture and its successful introduction into our provinces, according to the diversified requirements of different soils, crops, &c., &c.

Comparatively little has been done to improve Boydell's system since it was first introduced in 1855. It is capable

of very great improvements, and as we have seen land cheaper cultivated under this system than we have yet seen under any other, nothing can be more premature than some of the hasty conclusions advanced against this system. The objection that it compresses or consolidates moist clayey soils may turn out eventually to be its greatest recommendation, for it involves a specific principle, essentially necessary to the successful culture of light sandy soils, and also other soils that require compression under peculiar circumstances. Such being an acknowledged fact—a principle of so much practical value in the cultivation of a very large area of land—who can tell what progress discovery may make in the reduction of this principle to practice? especially when it is borne in mind that all the other systems can be engrafted upon this one at a very trifling expense, and is already beginning to be so engrafted.

Fisken's system stands in a somewhat similar position to Boydell's. When it first appeared, its rope system of traction was subject to very serious objections, but these are capable of being greatly improved. Unfortunately, however, little has been done to remove them; owing, we believe, to the want of capital. It possesses a specific principle, which none of the other rope systems possesses, but which steam-culture requires, and therefore it would be highly improper to limit the progress of that one principle being reduced to practice.

Smith's Woolston system, again, involves, specific principles of a two-fold kind—the one artistic, and the other commercial. Both are invaluable. The latter, we shall notice hereafter, the former here.

Of all the improvements in modern husbandry, that of scarifying and subsoiling land merits special patronage and encouragement, from the unprecedented success which has attended the practice. It is too well-known to require description. Specific principles are involved in the construction of implements, and also in the cultivation of the soil, the latter principles being directly opposed to the rule or definition of steam-culture as laid down by the Royal Agricultural Society for the guidance of its judges at Chelmsford, &c. To make a long story short, these are the principles involved in Smith's Woolston system—principles that merit the greatest amount of attention which the above Society, and the agricultural public generally, can possibly give them. Every encouragement should be given to steam implements of this class to compete against each other, in order to stimulate progress, and decide practically what improvements are annually being made. To allow Smith's scarifier to compete with Fowler's plough may be *practice*, but it certainly is not "*practice with science*," but *practice without science*! In permitting competition of this kind, the above Society is obviously deserting (unintentionally, it may be) its standard!

Fowler's steam-plough, and other steam-ploughs and modes of rope traction, form a system that embraces several principles, both in the cultivating apparatus, and also in the work performed, that demand consideration exclusively on their own respective merits. At one time a conclusion became very prevalent that the plough was about to be superseded; but the progress of discovery obviously proves that the conclusion was premature, for at the present time this implement is as popular under steam as ever it was under horses. The best mode of covering manure, stubble, &c., on the principle carried out by the plough, and the best construction of implement for the purpose, &c.,

&c., involve many important practical questions. Rapid progress has been made in this department of steam-culture, while discovery is actively engaged in advancing this popular line of progression.

The rotary system next comes in for its share of attention. It was once a favourite theory in the estimation of many, and although it has not yet become a successful practice, that is no reason why improvements should not be made, and successful results obtained in certain fields for which the principle may prove itself better adapted than any other.

What has just been said of the rotary system is equally applicable to the guide railway system, and other systems, which may have a field of action for which they are specially adapted.

We now come to the commercial view of steam-culture. Under this head, the first thing that demands notice is the fact that the ground is already occupied by horses. Steam has driven our teams out of the barn and stack-yard, and now it is slowly working its way into our fields, apparently determined on another and a greater conquest than the one already gained.

The question that here demands special attention is the fact that farmers have already a large available steam force at command, employed at present for a short time only, in thrashing their corn; consequently, it has a large amount of spare time for action in the field. When Boydell and Fisken made their appearance at Carlisle there were a great many portable engines in the provinces almost exclusively employed in the stack-yard. It was natural for the owners of these engines to entertain the proposition of yoking them to their implements, and for inventors to adapt their inventions to this available force of steam. Such was, at the commencement, the commercial view of the question, and of its soundness there cannot be a doubt; for we at this date find a large number of these very engines yoked to Smith's implements, while others who had not portable engines in 1855 have ordered new ones since, for the two-fold purpose of thrashing their crops and cultivating their land.

There is involved in this adaptation of the common portable engine to work a cultivator a commercial principle of the highest nature, as it brings into the field a large available steam force, and thus economizes capital in a two-fold investment, while the profits or produce of the farm are increased in a corresponding manner. Less capital is required to start in steam culture; the lands are better cultivated, and heavier crops harvested. Again, fewer horses are required; while the food thus saved goes to the market in the shape of an increase of live stock or dairy produce. These are special advantages of no ordinary nature; and therefore suitable encouragement should be given by the Royal Agricultural Society, and all our agricultural societies, to the means that produce them. Indeed, commercial questions of this kind stand more in need of the support of Societies than the purely mechanical one of the best steam culture system in the abstract.

Examined from this commercial point of view, Mr. Smith's Woolston system merits no little commendation. Much of its success and popularity depends upon the simplicity of the implement and tackle, and their adaptation to the common portable engine already in the employment of farmers for thrashing. Perhaps as much of its success is due to the little money required to start it, as to the peculiar mode of cultivation previously noticed, invaluable

as the latter may be. It is, however, when both considerations are taken into account, that the real merits of this system are appreciated.

In examining Mr. Fowler's system from this commercial point of view, it must be specially observed that it comprises both ploughing and scarifying. It is, therefore, a more comprehensive system than Smith's by at least the one-half; so that the comparisons so frequently made, that the latter is the cheapest system, is highly inconclusive and objectionable. In commerce, it very frequently occurs that the low-priced article is not the cheapest; and this rule is just as true in steam culture as in any other branch of industry.

Again, the commercial value of each of the systems now in the field will very much depend upon the amount and quality of work it performs, the number of hands required to work it, the daily tear-and-wear upon it, its liability to accident, and its general durability.

To this cursory review of steam-culture much might be added in this place, under each head, did our limits permit. Although steam is fast superseding horses in the cultivation of land, the conclusion is manifest, that the pioneers of progress are not receiving that encouragement from agricultural societies that they and the cause they have so warmly espoused merit.

PRACTICE WITH SCIENCE.

THE ROT IN SHEEP.

The malady at present so prevalent amongst sheep in some districts arises chiefly from a diseased state of the liver owing to the presence of the *fluke-worm*, with, of course, the cause and the consequences attendant upon such a pathological condition of the system. Many butchers we have met with appear taken by surprise when told that the livers hanging in their shops are full of fluke, and that the mutton of sheep, comparatively healthy in appearance, is unfit for human food. In some cases that have come under our notice their incredulity on being accused of selling diseased meat was only equalled by their surprise on cutting up a liver, when flukes made their appearance, sometimes in large numbers. On the other hand, some butchers who only kill second-rate quality of meat look upon the affair with indifference, as something common and unavoidable.

The liver-fluke (*Distoma hepaticum*) is one of the most common varieties of worms with which our domesticated animals are infested. It is found in the liver of the horse, the ass, the ox, sheep, goat, deer, hog, &c. But amongst sheep it perhaps plays greater havoc than in any of the other examples. Man is also subject to it. The treatment is like that required for other worms; but the expulsion of the fluke is more difficult, owing to its situation.

In the management of live stock the prevention of disease is the grand maxim of veterinary science. First to allow animals to become diseased through improper food and treatment, and then to waste them with drugs, is pleading guilty to a two-fold example of mismanagement, both of which ought to be avoided, for if proper food will prevent fluke and other entozoa, drugs will not be required. When improper food is given, it is always accompanied with an improvident waste of the elements or raw materials of which it is composed; and when drugs, such as turpentine, &c., are administered, the animal system experiences a similar waste. On the contrary, when proper food is given, the greatest economy of the raw materials is effected, while the different functions receive each its natural stimulus, and consequently the animal enjoys the greatest degree of health. A given quantity of food thus goes farther length, producing more live weight of a superior quality for the market; while the expenses for medicine, &c., &c., are saved.

It is a well known fact in natural history, that the sheep is an animal which requires in its food a large amount of those aromatic bitter properties whose action, when exhibited alone in any quantity, is anthelmintic, such as tansy, agrimony, tormentil, artimisia, &c. Such

being the natural food of this quadruped, the inference appears reasonable that food deficient of such properties would have a tendency to produce a debilitated state of the system, with worms. Like all other vermin, worms require a certain unhealthy state of the system before their appearance takes place; and whenever those parts of the body which they infect take on this unhealthy state, they (worms) seldom fail to make their appearance, while their presence preying upon the aliment that should support the system—or upon the vital fluid (blood), if not upon the living organism itself—as seldom fails to increase the primary malady, eventually breaking-up the constitution.

Such is just what many now see exemplified in their flocks. At first the debility or indisposition may be so slight as to be imperceptible to the shepherd. When in a state of health Nature struggles hard in the outset to throw-off any slight affection of this kind with which she may be seized, so that the difference between the building-up, and pulling-down, or the general loss of health, may be very little; nevertheless, like the thin edge of the wedge, when once begun the debility daily increases, until the result is attained—"a rotten sheep."

Many of our old vernacular expressions are very significant, and that of "a rotten sheep" is by no means wanting in this respect. A certain degree of rottenness is an essential concomitant to the presence of worms. If the alimentary canal is in a healthy active state worms could not remain in it, were it possible for them to be generated therein; but when the absorbent and excretory organs lose their tone, and slimy matter accumulates, worms are formed, and prosper amazingly at the expense of the sanitary wellbeing of the animal, that condition of the system which is health to the former being disease to the latter. What is true of the alimentary canal is also true of the hepatic organ.

Opposed to this rottenness in sheep, we have the antiseptic properties of the remedy applied to effect the expulsion of worms, or what is better, to prevent the formation and development of worms in the liver and other parts of the body. When the food contains a sufficiency of those stimulating aromatic and bitter tonic properties, the alimentary canal is not only kept in a healthy state, and free from slimy semi-putrid matter conducive to the formation and development of worms; but from these properties being taken up into the system by the absorbents, the hepatic organ and other organs are also kept in a healthy condition, the whole absorbent—secretory and excretory—

functions receiving each its natural stimulus, and being thereby preserved in an active healthy state.

Examined from a physiological point of view, this is more particularly the case with sheep, especially as regards the hepatic organ. In all animals this organ has important functions to perform, consequently it requires a regular supply of its natural stimulus; but in the case of the sheep it is manifest from various reasons that this organ has got extra work to do, and that consequently it requires an extra supply of those properties to maintain it in a state of health. The same may be said of the alimentary canal and all the other functions of the body—the whole of them, including the excretory functions of the skin, requiring an extra supply of those bitter aromatic properties which sheep are naturally fond of in their daily food. The experience of every intelligent observant shepherd must verify this, as herbage of this kind is industriously searched for by the sheep, especially animals of a delicate constitution or, in a feeble state of health, and greedily devoured by them in quantity as instinct guides them. And where such herbage cannot be found on their own walks, instinct often guides them long distances to satisfy the wants of nature. The distance which deer will go to drink sea water and bathe when infested with intestinal worms, and which sheep are known to go to lick salt rocks for a similar purpose, is almost incredible. In all such examples the natural instinct of these two animals (deer and sheep) displays certain hygienic principles highly instructive on the present occasion, and well worthy the serious attention of agriculturists.

The peculiar character of the fæces and urine of the sheep may be quoted as one of the reasons referred to above why its food should contain a large proportion of tonic, diuretic, and diaphoretic properties, as tansy, wild thyme, and heath. The yolk of the wool is another product peculiarly characteristic of this animal. When these peculiarities are examined from a chemico-physiological point of view, they cannot be satisfactorily accounted for in any other way than by an extra supply of those bitter aromatic and saline plants of which sheep are so fond, and which they consume in large quantities in all elevated and healthy grounds. Lord Bacon, Cuvier, Griffiths, and writers generally on the natural history of this interesting quadruped draw attention to the peculiar quality of the herbage it consumes when grazing at freedom uncontrolled by the artifice of man; and when we follow up the inquiry relative to the quality of the mutton manufactured from this food, and the daily waste excreted from the system, including the physical and chemical characteristics of this waste, the reasons involved in our proposition must appear manifest to every intelligent reader.

We have said a deficiency of bitter aromatic principles in the food of sheep is sufficient to produce liver fluke and "rot." The opposite of this—a sufficiency of those principles will be, of course, the preventive remedy required. The proposition is of a very general character, as the quantity of those condimental principles required by a sheep will depend upon the nature of the season and many other conditions besides, too numerous to mention. The past wet, cold season, for example, is one that would have required, comparatively speaking, a larger proportion than usual, while it had a natural tendency to produce principles in plants of an opposite character—the whole country almost being reduced to the level of low marshy ground, with its unhealthy produce, when considered as food for sheep.

How far such a deficiency was realized last year is a question for practical chemistry to solve. In the absence of experimental evidence from the agricultural laboratory, we can only enunciate the general proposition, that a deficiency of such aromatic bitter principle did exist last year, and does exist generally in the food of our sheep on all arable lands and low-lying meadows or pastures, and that science points to the propriety, if not to the necessity of an artificial supply. It is long since Lord Bacon proposed the cultivation of plants on elevated grounds to improve their condimental properties, and it certainly would not be a very great stretch of experimental inquiry to take a lesson from his "*Sylva Sylvarum*," by reducing to practice the principles which such a lesson involves. Some fields are very prone to produce tansy; others heath, wild thyme, tormentil, &c. Can we not learn to husband such products artificially, and convert them into healthy sheep, fine-flavoured mutton, cash at our bankers, and so forth? and thus get rid of fluke worms, and rotten mutton, with the inexpressible stomachic troubles, and bowel complaints, to which its consumption give rise.

There is unquestionably involved in these suggestions a profitable field of industry, which already may be seen looming in the distance—there being large areas of land naturally disposed, so to speak, to yield such plants, but which refuse to produce any other with profit. The day therefore may come, and, for aught we know, may be close at hand, when some farmers will not be laughed at for growing "fine crops of tansy" and tormentil. Moreover, there are other plants besides these which such soils may profitably yield—plants which sheep are particularly fond of, and which are known to be conducive to their health, and whose medicinal action is calculated to prevent the formation and development of fluke in the liver and entozoa generally in our domestic animals. The subject is one of those that partakes of a national character, and therefore demands the undivided attention of the public. It involves a manufacturing and a commercial question as well as one purely agricultural, and, if discussed in the light of scientific progress, it cannot fail of ultimately being profitably reduced to practice.

Since the above was written, the writer has read with much pleasure a report on the liver-fluke by Professor Simonds, whose views appear to harmonize, in principle at least, with those expressed in the above article. Unquestionably the practical plan of treating "rot" in sheep is to prevent the formation and development of fluke in the liver by means of anthelmintics—condimental properties of which this little mountain-loving quadruped is naturally partially fond. With regard to the herbage of sea marshes, so often quoted, and to which Mr. Simonds refers, having once farmed an extensive grazing tract of this kind outside the embankments of arable land reclaimed from the tide, we may mention that this herbage contained anthelmintic plants that were greedily eaten by sheep; and if this is true generally, the prevention of rot cannot legitimately be attributed solely to the presence of salt from the frequent overflowings of the tide. Again, the conclusion that extra moisture is the cause of fluke and rot does not appear warranted by fact; for in the Western Isles, and highlands of Scotland and Ireland, where tormentil, tansy, and other anthelmintic plants grow abundantly, sheep do not suffer from fluke in the liver, although the degree of humidity is ten-fold greater than in those districts where rot now prevails. Moreover, Dr. Paris, in his *Pharmacologia*, when treating

of "*bitter-extractive*," says—"Animals that feed in marshy lands on food containing but little nourishment are best defended from the diseases they are liable to contract in such situations by the ingestion of bitter plants. Thus has it been found that the *Menyanthes trifoliata* (the water trefoil*), which, on account of its bitterness, has been used as a substitute for hops, is a cure for the rot in sheep, when given in doses of a dram of the powdered leaves; and Dr. William Bulleyn, the contemporary of Turner, the father of English botany, observes in his work entitled 'The Bulwark of Defence,' that tormentil in pastures will prevent the rot in sheep. Upon these occasions Nature would appear to be very kind, for the particular

situation that engenders endemic disease is generally congenial to the growth of such plants as operate as antidotes." In corroboration of this last sentence we may remark that in the moist climate of Killarney tormentil grows so plentifully that the roots are dug up and given to pigs; and in the Scottish isles they are used in the tanning of leather. Thus looking at the facts of the case as we find them exemplified in our provinces, we arrive at the conclusion [advanced above]—that our sheep require bitter plants in their food, as well as salt, in order to prevent rot; and that such being the natural food of this animal, they must be, under artificial systems, artificially supplied.

W. B.

THE DEMAND AND SUPPLY OF WOOL.

The dearth of raw materials for our staple manufactures, and especially for our textile industries, is becoming a matter of grave interest. That is, if our factories are to be kept employed and our leading industries are to advance, instead of standing still. Even in the matter of oak timber for naval purposes the Admiralty are at their wit's end, for iron will not serve all purposes of naval construction, largely as it has of late been pressed into the service. Owing to the scarcity of good oak for naval timber, and its high price, in the Government dockyards and private yards, oak is now only used in parts where nothing else will do so well; and the next best timber is so sought after. The Admiralty are now, at considerable expense, making search for useful timber, by competent persons, in North China and Japan, the West Coast of Africa, up the rivers of British Guiana, and in Tasmania.

Cotton and flax, too, are both deficient in supply, and the Secretary of State has had to communicate to the colonies the extreme want felt by the manufacturing interest of Great Britain of raw material for the production of textile fabrics. This has induced an application to the General Association for the Australian Colonies, for the purpose of discovering the existence (if any) of some fibrous product in the Australian continent, that might tend to remove the difficulty, and at the same time prove a sufficiently valuable article of commerce to ensure its being successfully and profitably cultivated.

In another great industry the manufacturers are crying out for larger supplies of raw material. Wool is not so abundant in the market as could be wished, great as has been the progress of production in our colonies of late years. We have learnt to utilize all descriptions of wool, from the long silky fleece of the Angora goat to the low common wools of China and India. But yet the manufacturers cannot keep pace with the demand for worsteds and woollens at home and abroad. Other nations also press for supplies of wool, and compete with us in the markets of the world. Already about £10,000,000 a year are required to pur-

chase foreign and colonial wools; and we should be ready to greatly increase this sum, if we could obtain additional supplies at moderate prices. But there has been a gradual upward tendency in prices, owing to increased foreign demands and limited supplies. A leading firm of Liverpool brokers thus speak of the matter: "The position of the woollen and worsted trades throughout the manufacturing world is such as to bespeak grave reflections, and ought to command an active sympathy—they are not extending in the same ratio as other branches of industry, and are precluded from doing so for want of adequate supplies of the raw material. The cry of scarcity which has been sounded for the last eight or nine years has produced no practical effect, the small increase of growth having been absorbed without any relief. In England economising expedients have been resorted to, on an enlarged scale. The use of cotton in woollen and worsted fabrics has been vastly augmented; and the manufacture of rag-wool (which consists of old worn-out woollens, torn and ground up) has been developed into quite an important branch of business, under the name of 'shoddy' or 'mungo.'" The rag-wool is now utilized to the extent of at least 50,000,000lbs. annually (equal to more than one-third of our yearly importations of colonial and foreign wools) for the purpose of mixing with or adulterating wool in its manufacture, to the great complaint of consumers and buyers of manufactures. This trade, both as regards collection, distribution, and manufacture, is attaining gigantic proportions. Instead of consigning old woollen rags to the soil as manure for hops or other plants, every shred is carefully collected and sorted; and as an article of import, the samples may be seen in city brokers' offices as often, if not to the same extent, as raw wool. So in Leeds, as other towns of Yorkshire, the business of the rag-grinder has become most important, for in Leeds alone there are a dozen or more factories, which produce about 4,000,000 or 5,000,000lbs. of this rag-wool annually. The pieces, or patches, of cloth are forcibly torn asunder, and remodelled into raw material again, to be once more used by the first customer. The mania for cheap goods has no doubt something to do with this branch of the trade, but deficiency of foreign

* Baxter, in his "Library of Agriculture," quotes an instance where the presence of this plant (water-trefoil, or buck-bean) prevented the rot; while in the adjoining pastures, where it did not grow, rot prevailed.

supply is a main cause. Yet, with these enormous aids, the prices of wool, when not checked by adverse extraneous influence, ever gravitate to an extreme range—such, in fact, as effectually to limit the consumption.

The commercial treaty with France is calculated to give additional stimulus to the exports of woollen fabrics, and to develop more particularly the resources of the carpet and worsted trade. There will thus be a great outlet in China for English woollens: so that while there is at present positive scarcity of most current descriptions of wool, there is a great fear of a further deficiency in supply of the raw material.

Looking to the continent for any probable additional supplies of wool, we find that Russia, with all her large flocks, can spare us but little, and there is a decrease rather than an increase in our imports thence. Germany wants all she produces. The imports of wool and woollen yarn in Prussia have been doubling each five years, and the number of sheep decreasing. France is now a large consumer of foreign wools, in addition to her own home supply and the production of Algeria. Four or five years ago her foreign imports of wool were upwards of 83,000,000 lbs., and she supplies woollens to the value of £1,000,000 yearly to Switzerland. The consumption of foreign wools in Belgium has been largely on the increase. From the continent we have little, therefore, to expect in the way of increased supplies. Looking back at the last five years, we find that there has been a considerable decrease in our import of German wools, a small increase from Spain and Portugal, a decrease from Iceland and Russia, and stationary supplies from South America generally.

The imports of wool into Liverpool in the last eleven years show a remarkable progression, and yet the supplies are quite insufficient to meet the wants of the manufacturers. In 1850 only 63,774 bales of foreign and colonial wool were received at Liverpool; in 1855 the supply had increased to 113,098 bales; and in 1860 it reached 200,382 bales. This forms a large proportion of the entire imports of the kingdom, which in 1860 were 485,356 bales.

It is true that our aggregate imports of foreign wool have gone on increasing; but so have our exports of wool and woollen manufactures. Last year our exports of home-grown wool were enormous, exceeding 28,000,000 lbs., besides the same amount of colonial wool re-exported.

THE SOURCES OF SUPPLY OF FOREIGN WOOLS HAVE BEEN AS FOLLOWS, IN BALES:—

COUNTRIES.	1850.	1855.	1860.
Germany	30,491	12,710	14,600
Australia	138,699	163,182	184,000
Cape	19,899	38,292	56,356
Sp-nish	2,105	213	4,183
Portugal	9,361	4,522	24,503
Peruvian and Alpaca.....	39,731	42,070	69,075
East Indian and China.....	9,701	43,167	62,651
Russian	9,758	1,008	21,445
Mediterranean ports.....	13,432	12,086	18,162
Buenos Ayres	3,841	6,338	5,058
Sundries.....	3,041	5,986	15,650
Goats' wool.....	13,139	14,154	11,897
Total bales	291,161	343,686	487,580

Unless we receive additional supplies from India, and our southern colonies, we know not where more wool is to come from. The production of Victoria can scarcely be more pushed at present. Tasmania, New South Wales, and Western Australia will hardly be able to send forward more wool as yet; nor can New Zealand do much, unless with additional labour. Increased supplies might be obtained ere long from the new colony of Queen's-land, in the north, if labourers for sheep-tending were available, as there are yet boundless plains of pastoral land unappropriated. In British Kaffraria, and the more northern districts of Southern Africa, there is ample scope for increased wool-production, although there are difficulties in bringing it forward for shipment. The wool-production of the Cape Colony has already doubled every five years. From India we have been drawing large supplies of low coarse wools, and there is an increased field for material of a peculiar class, fitted at least for some purposes. But, as Messrs. Littledale, of Liverpool, well observe: "Our present customers are evidently taking all that we have the raw materials to make; and as the high prices of 1853, 1857, 1859, and 1860 have palpably failed to influence anything like a proportionate increase of supply, the present scarcity must for all practical purposes be considered absolute; *ergo*, all business in woollen and worsted goods to new customers must necessarily be so much abstracted from all the old ones! This is a most unwelcome conclusion to arrive at. To men of the world, having the word *progression* eternally on their lips, it sounds incredible; but who can gainsay it? Better ask, Where can we look for help? What we want is *more wool*, for which we can give a good price—fifty per cent. above what was considered profitable to grow it ten years ago! We might point to Canada as especially capable of assisting our growth of English, to South Africa for an increase of fine colonial, and to India for a larger supply of low wools; but if the stimulus for excessive price has proved insufficient to effect the desired purpose, we are at a loss for a stronger inducement."

The unusually severe weather experienced during the winter and spring of 1860 caused a great falling-off in the production of home-grown fleeces, and consequently led to an increased inquiry for all foreign wools that could in any way be adapted as substitutes. As this deficiency is a very important item of our supply, and is likely to be again experienced this season, it becomes a serious question how the demand is to be met, supposing consumption to progress at the present rate. Messrs. Ronald, the wool-brokers, one of our own correspondents, state the position of our market seems at present to be this: "There is an increase in the imports of wool, according to the official trade returns, of 10 per cent., from which must be deducted an increase in the export of wool of 9 per cent., thus leaving a surplus of 1 per cent. only. Against this, however, there appears an increase in the exports of manufactured woollen goods and yarns of 8 per cent., which, added to the defi-

ciency in the home-growth of 15 per cent. last year, leaves the supply of wool 22 per cent. short of that of 1859."

There is great room for improvement both in growing and preparing wool for English markets; and some useful hints have lately been thrown out on this subject by brokers. Many countries, particularly North Africa, Turkey, Egypt, Russia, Portugal, and the East Indies, possess breeds of sheep, the wool of which, by the introduction of suitable rams, or by judicious crossing with the best of what they already have, might be vastly improved, and rendered adaptable for

many additional purposes. Care should be taken to eliminate those sheep whose white wool is spoiled by a sprinkling of thick coloured hairs. The wool should be sent to market more free of burrs, seeds, and filth; and the matted, inferior, and coloured fleeces should be packed separately from the good white ones. At the same time an indiscriminate growth of long wool is not at all desirable, for the climate and herbage of some countries, which eminently favour the Merino and Mes-tizo breeds, but that would prove altogether unsuitable to a larger kind.

THE GRASSES.

Most practical subjects are capable of being reduced into a very small compass, within which the whole merit may be compressed and very easily understood. Nature is grand in its projects, but simple in its operations, and delights to exhibit its information to the easiest observance; careful in provision, its bounties are strictly appropriated; profuse in luxuriance, its largesses are confined to use; and when niggardly in economy, its deficiencies are intended to convey the lessons of benefit and advantage. Profusion and deficiency are alike useful in marking the boundaries of adoption and adaptation.

A grass plant is very peculiarly distinguished by a tubular and jointed culm, and by the leaves sheathing the stem. The vegetable kingdom does not contain a more numerous or important order of plants, or any one that is more clear and distinct, more definitely marked in the character, or the habit more easily perceived. The value, as affording grains for the use of man, and herbage for cattle, is well known. The farinaceous albumen supplies the human race with the staff of life, in wheat, rye, barley, oats, rice, and maize, and forms a great part of the food of many birds and small quadrupeds. The herbage is perpetually growing, is very tenacious of life, and easily accommodated to almost every climate and situation; affords to nature her most welcome clothing, and the chief riches to the cultivator of the soil. Many of the grasses are very gratefully aromatic, but none are poisonous, if we except the slight intoxicating quality attributed to the seeds of the *Lolium*, in the species "*temulentum*." Nature has most wonderfully provided for the propagation of this class of vegetables; one of the most useful that is possessed by mankind. The seeds are small, light, and easily transported from one place to another; the roots are creeping or fibrous, and send forth many shoots, which quickly cover the ground, and by the yearly decay of the stems and leaves, they afford a constant supply of decomposing matter in the earth for the nourishment of future growth. Wherever any appearance of earth or vegetation can exist, some of these universal inhabitants of the globe are found struggling into life, both for the purpose of propagation, and for supporting other members of the creation. Nature

has also protected them in various ways; most of them are perennial, and though the leaves be cropped and destroyed, they are soon replaced; the creeping roots, though bruised and hurt, are not destroyed, and the winter's cold and the summer's drought are alike unable to extinguish the principle of life. They are the most important division of the vegetable kingdom, and constitute about one-sixth part of all the plants that are known on our globe.

The habits and appearance of grasses are at all times sufficient to distinguish them, independently of the general characters they hold in the specific arrangement of plants. The stalk and leaves are so simple, and so like in the greater number of the plants, that a mistake can scarcely happen in ascertaining a member of the family, with but little knowledge of the scientific system of distinction and nomenclature; the seeds and inflorescence also afford a distinguishing feature from the surrounding vegetables. Most of the family are herbaceous, and very few plants rise to the hardness of wood; the useful grasses, strictly speaking, are wholly herbaceous. The general character of the family, however numerous the plants may be and distinct from each other, mostly agrees in the following particulars, the minor differences being sunk in the general character: The stalk is simple and unbranched. The stems or culms are cylindrical, straight, tubular, and jointed; roots fibrous and capillary; leaves alternate, quite entire, mostly flat, if rounded, not on the side next the stem. A leaf rises from each joint, linear or lanceolate, marked with lines parallel to the midrib or middle nerve. The leaves sheath the stem for some distance, and one arises from each knot, the sheath splitting down to the joint, and crowned with a ligula, which closely embraces the stem in growing, seemingly for the purpose of keeping out the water. The glume is husky, single, or containing several florets. The seed-cup resembles the husk, rarely wanting, often of several valves, of which the outer is awned. Seed, solitary, naked, often clothed, with the inner valve of the cup attached. The flowers are in dense clusters, or spiked in a common rachis, or panicked and concealed in the sheath of the upper leaf, till they emerge to complete their maturity. The seeds are farinaceous or mealy, and

afford the well-known substances so much used as food for man and beast. The grasses are mostly insipid and devoid of any peculiar taste, and some are fragrant when dry. They are the most simply constructed of all vegetables, having neither thorns, stings, tendrils, bractes, or prickles, or any other appendages. The plant is mostly simple in our own country; in others, it is divided and branched.

Gramineous herbs are such as have a long narrow leaf with no footstalk; the tribe is divided into *corn*, and *grasses*, which differ merely in the bulk of the seeds, which form the basis of our aliment, and nourish the winged creation.

The greater part of the grass plants are confined to the use of permanent pastures; the natural qualities and habits, joined with the effect of soil and climate, reduce the number of useful grasses to a very small amount, when compared with the large numbers that exist. Some are very coarse, and wholly innutritious, and are refused by all kinds of ruminant animals; many are puny in habit, and diminutive in growth, and the seed is scanty, and the plants do not appear in vigour for some time after the seed is sown; while others appear quickly, and decay gradually, after enduring for a time, and often disappear altogether, or yield a very scanty produce. In modern husbandry, grasses are used for three purposes: for hay, in a crop of one year; for pastures, in two or three years, in alternation with green crops; and for making permanent meadows, in imitation of old pastures. For the first purpose, which is mostly followed on the best land, the plants are most useful which grow readily, and produce the greatest number of stems, without running to height in a smaller number, and yielding a coarse produce. For the second purpose mentioned, of being two or three years in grass, after the first year's crop is cut for hay, the above-mentioned quality is required, along with a stoloniferous creeping habit, and a nature both perennial and persistent. For permanent meadows, the quickly productive quality is not so very essential, though nevertheless still valuable: the persistent perennial quality is absolutely necessary, with an ample produce of seed to be annually shed, and a very strong reproductive power from the roots and stolons. A nutritious quality is also required, and a fair produce of juicy succulent leaves, in order to afford a grateful herbage to the animals that live and fatten on the verdure of nature. But observation has long since found, that the bounty of nature has not placed every quality in any one single plant; that some one enjoys a property in which others are wholly deficient, and that a mixture of plants is seen to be provided by nature itself, in arranging this class of its productions for the destined purpose. The observation of man is therefore required to select the plants that are suitable to his purpose, which necessary discrimination can be the result *only* of long experience and of very patient investigation.

The Romans cultivated forage or herbaceous plants, for the purpose of being used as green fodder for animals in the stalls, and for being made into hay. The plants of lucerne and cytissus are

specially mentioned, and others may have been used, though sunk by the superior value of the two that are recorded. When the use of printing had become diffused in the sixteenth century, the records of agriculture show, that modern practice was copied from the Romans, and subsisted upon their example, which may have lived through the dark ages after their dominion of the island, and reintroduced by the writings on agriculture. The use of forage plants appears along with other practices in the early records of Britain. The first practical work (by Fitzherbert, in 1532), mentions the mowing of grass, and forks, and rakes, but no artificial plants are noticed. Clover, sainfoin, and lucerne were introduced by Weston, Hartlib, and Blythe, and was specially honoured by a voluminous preface by Yarrington in 1663. In 1669, Worlidge mentions ray grass in "a treatise on husbandry," and writes thus—"Ray grass improves any cold, sour clay, weeping grounds, for which it is best; but also good upon dry uplands, and stony, light, sandy grounds; precedes all other grasses, endures the summer drought, rises early in the spring; not easily overstocked, and becomes sweet by being eaten down; often light for meadow hay, is best for horses or sheep, being hard; a good winter grass; sown with two bushels on an acre, better in three bushels, with nonsuch; being a thin spring grass, arises little the first year, succeeds the falling nonsuch, and thickens upon it. Four acres thus sown, have yielded 20 quarters of seed, and 14 loads of fodder, besides spring and autumn feeding, when six or eight cattle usually grazed." Nourse, in 1700, writes in his work "Compania Felix"—"It is a spiry, bent sort of grass, an improvement, of like continuance with clover, and thrives best on cold, wet, and gravelly grounds; is not so much in vogue as clover and sainfoin."

This is the first account of grass plants being used artificially, and along with nonsuch or yellow clover. This practice had been continued with no deviation, and at this time it constitutes the greater part of modern grass farming. Within the last half century, some few grass plants have been brought forward into notice, and with some success.

Our experience has exceeded thirty years in the use of grass plants in a crop of hay for one year, and for one and two years of succeeding pasture, and an extensive and very varied practice has reduced into a small number the grasses that suit the farmer's purpose. In the order of value, the plants are

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|--------------------|--------------|
| 1. Ray grass | 4. Cocksfoot |
| 2. Meadow-fescue | 5. Foxtail |
| 3. Meadow catstail | 6. Dogstail. |

This arrangement is grounded on the results of practice, and the following descriptions are given from experience, without any botanical language or statement of chemical analysis. The first confuse the apprehension, and the latter mislead the judgment; being introduced as lights, they only serve to darken the progress.

RAY GRASS.

The ray-grass plant has the flowers aggregate on

a jointed or toothed common stalk, or rachis, hollowed in the sides, into which the seeds are pressed; the receptacle is elongated into a spike, which is many-flowered. The glume or husk is constantly of one valve, which is awl-shaped, and contains many flowers; seed one, oblong, contained in unequal valves, the outer one curved slightly; root fibrous, annual or perennial; stems several, jointed, leafy; leaves flat; spikes two ranked, of numerous alternate spikelets. The husk is permanent in one valve; the second one is very diminutive, if at all present, the place being supplied by the side of the stalk, to which the sessile spikelets are closely pressed.

This plant flowers about the second week in June, and the seed is ripe about the same time in July. In the experiments that were made on the produce and qualities of a great number of the grasses, the results of which were published in the "*Hortus Gramineus Woburnensis*," the ray grass of an improved variety produced at the time of flowering 7,827 lbs. of herbage per acre, and at the time of the seed being ripe, 14,973 lbs., and of lattermath 3403 lbs.; the quantity of nutritious matter differs but little at the time of flowering and when ripe, and one-half in the lattermath; the value at the time of flowering and when the seed is ripe, is as 11 to 10, and to the grass of the lattermath as 5 to 2; it is inferior to cocksfoot as 5 to 18, and to foxtail as 5 to 12; and to meadow-fescue as 5 to 17: results quite contrary to the practical opinions of the utility of the respective plants. The leaves of ray grass, cut in April, from 1920 grains gave 70 grains of nutritive matter, of which 100 grains gave 65 of mucilage or starch, 7 of saccharine or sugar, and 28 of bitter extractive or saline matter.

Doubts have been entertained of the persistent perennial quality of ray grass, as it has been observed to fail in certain places within a few years, and it has been conjectured that a partial perennial property has been accidentally derived from the annual plant. This observation has not extended to any fixed diminution in the persistency of the ray grass. It has been objected as being benty in the stem, and spiry in the whole plant, wanting in foliage, and deficient in the lattermath.

The very great and innumerable properties of ray grass, in which it excels all other grasses, are a readiness of growth on a large variety of soils, from the burning sand and arid chalk, to the strongest clay that is cultivated; the produce of an abundance of seed, which is sound and healthy, easily gathered, and very conveniently manufactured; the sending up for crop a number of stems of equal height, thereby resembling the grain crops, being the most valuable property which a grass plant can enjoy, and always yielding, with more certainty than any grass, a fair crop of herbage that is of sufficient quality and ample in bulk. The spiry bentness is only found on inferior grounds, disappearing in good cultivation, when the stems are succulent and juicy. No plant is more susceptible of change from altered circumstances.

The most enlightened and extensive experience directly reverses the results stated by the "*Hortus Gramineus Woburnensis*," and places the ray

grass in the scale of superiority for general utility, whatever the chemist may determine. The single quality, avoiding all others, of resembling the grain crops, in a number of stems of an equal height, is quite sufficient to overturn all the chemical opposition in the matter of quality. In fair cultivation, the ray grass yields a sufficient foliage and lattermath. For a crop of hay, one bushel of seed along with clover covers an acre of ground; for two years in pasture, half a bushel is sown, and for permanent pastures one-fourth of a bushel, as it is still acknowledged that ray grass must hold a chief place in any sowing of grass seeds. If it disappears ultimately in a certain degree, it grows readily at first, and affords herbage till others advance, and supply its place; when cut for hay, it yields a ready growth, and when pastured, it shoots and flowers frequently during the season.

The general merits of ray grass very fully justify its being placed foremost in the list of grasses. In some one point it may be excelled, but no grass is known on which the farmer can so much depend for a crop of hay, and experience has not found many, if any, that are more valuable for pasturage, and in permanent purposes. Many grasses produce only one stem in the season; ray grass sends up a succession; it rises early in the spring, and is much relished by all kinds of grazing animals.

THE MEADOW-FESCUE GRASS

Very justly occupies the next place to the ray grass in respect of general utility. The stem is erect, spreading, leafy, knotty; leaves generally narrow, rigid, and glaucous green; flowers panicked, often purplish, nearly or quite erect; sometimes inclined, spreading, directed to one side, oblique; spikelets without awns, linear, compressed; florets numerous, oblong, obscurely ribbed; leaves flat; root fibrous and perennial. The grass is found in the richest pastures, and on land of mostly all qualities, but preferring those of a soft damp pasture; it is strictly and persistently perennial, very hardy, and grows readily on moist soils; it yields much foliage, and never becomes tufted like some other grasses; it ripens abundance of sound and healthy seed, which is easily gathered. Thus it possesses the valuable qualities of yielding an abundance of seed, a ready growth on moist soils, from the scorched sands and arid chalks, to the marshes and flooded lands; it yields a sweet and abundant herbage much relished by cattle, and is equally valuable for hay, alternate pastures, and in permanent meadows. For the two latter purposes, it is indispensable; and for hay of one year, no plant is so fit to accompany the ray grass, as it attains a size and produce the first year that is so necessary along with quick growth, for a purpose of short duration. The quantity of seed to an acre is 4lbs. in the three of hay, pasture, and meadow.

The produce of this grass on an acre at the time of flowering, has been stated at 13,612 lbs.; when the seed is ripe at 19,057 lbs., the nutritive matter of the latter being only one-fourth of the former. In point of nutritive matter in the crops of the season, and without the lattermath of the fescue, as it is rather late in flowering, it is superior to the foxtail as 11 to 9, and inferior to cocksfoot as 2 to

1. When the lattermath of the fescue is included, the value will approach nearer to the cocksfoot, and rise more above the foxtail; 1,920 grains of leaves of fescue gave 96 grains nutritive matter, of which 100 gave 59 of mucilage or starch, 200 of saccharine matter or sugar, and 20 of extractive or saline matter. It flowers about the middle of June, the usual time of cutting grass crops for hay, and ripens seeds about the end of July: the grass is not very early; cut for general purposes, it admits no superior, the ray grass excepted, which it exceeds in quantity of foliage; the strong growth sometimes shows a coarseness of stems and panicle, which does not accompany the compact inflorescence of the ray grass, and on these subjects the conclusions that are deduced from the experience of utility must outweigh the results of the laboratory. The fescue is preferred to the ray grass, in a ready growth on a large quantity of soils and a certainty of produce, a number of stems of an equal height that resemble the grain crops, a bulk of produce always fair in quantity and quality, and an abundance of healthy seed that is easily gathered and conveniently manufactured.

MEADOW CATTAIL GRASS

Combines several of the qualities that entitle it to a general recommendation. The culm or stem rises from one to three feet in height, according to the richness of the soil; the flowers are placed on a cylindrical spike, long and blunted, with the points of the seed cup forked; leaves lanceolate, pointed, rough on the upper surface; sheath striated, smooth; flowers crowded, on partial subdivided stalks; root perennial, creeping, sometimes tuberous and bulbous. The whole plant varies much from local influences, and often has a leafy spike by the seeds germinating in wet weather, without falling to the ground.

At the time of flowering, the cattail grass produced on an acre 40,837 lbs.; when ripe the same weight, but the quantity of nutritive matter was more than doubled: the lattermath yielded 9,528 lbs., and the same quantity of nutritive matter as at the time of flowering; 1,920 grains of leaves gave 80 grains of nutritive matter, of which 100 gave 74 of mucilage or starch, 10 of saccharine matter or sugar, and 16 of bitter extractive or saline matter. The ripe crop exceeds the flowering in value as 14 to 5, which circumstance gives great value to the plant for the purpose of hay. If these statements of comparative produce and value be admitted as an authority, it will be seen that cattail exceeds the foxtail grass in every respect except in the produce of the lattermath, an advantage that is much overbalanced by the greater produce and ready growth of the cattail grass. It thrives much on peaty lands, and in humid climates, and on all damp soil, and those that possess a degree of loamy softness in the composition; and is unfit for hot sands, gravels, and chalks, and for hard, sterile clay. With that exception, the best experience on a great variety of soils, and for a long period of time, has placed this grass second or third for general utility. It grows readily and abundantly, yields much seed, which is of good quality. On very good lands it has a tendency to produce height

of stems in place of number, and the leaves are soon blanched and yellowed with rain, in the making into hay; but the other grasses have a similar tendency, and all are inferior to ray grass in producing a crop of the greatest number of stems of an equal height. The time of flowering is little if any later than the cocksfoot, fescue, and ray grass, and for a crop of hay, for two and three years' pasture, and for permanent meadows, the cattail grass must form a considerable part of the mixture. A comparative trial of plants on a scale of superior cultivation and refined management can afford no criterion of general value; one plant will produce abundance in such circumstances, but will fail when subjected to ordinary cultivation, and another which showed only a fair produce in the experiment, will maintain it more nearly in ordinary management, and take the place of others; for it does not follow that a superiority in one state of trial will attend the plant in other circumstances, which are probably more unfavourable to itself, and more agreeable to others.

The cattail grass fails in comparison with the ray grass and meadow-fescue plant, in the number of stems of an equal height, and in the ready growth on the large variety of soils. The stems are harsh, and, with the leaves, are not so much relished by animals as the above-mentioned grasses. But on all damp well-cultivated lands, the cattail is a valuable grass sown at the rate of 4 lbs. to an acre.

COCKSFOOT GRASS

Has a fibrous tufted perennial root; leafy, simple, or branched stems, and the flowers in dense unilateral panicle tufts. The culms or stems are two to three feet high, with four or five purplish knots or joints, with rugged sheaths sharply keeled; leaves flat, glaucous, acute, spreading, rugged on both sides; panicle branched, distinctly and alternately turned to one side, glomerate; flowers in dense tufts, one-sided, terminate floret abortive; seed-cup often awned.

The cocks-foot grass is rather early in growth, and in many excellent old pastures it is mostly always found in the turf. It vegetates much during the winter months, and when sown in two bushels on an acre, with red clover, it has quickly formed a very good sward. As a single plant, to sow with clover for hay, it is altogether unsuitable; on good lands it sends up very strong coarse stalks, too tall and few in number, and unfit for fodder, and the hassocky tufted roots do not yield at that season a quantity of leaves to be cut for hay. But on inferior soils, that are used in pasturage for two or three or more years, in remote or high situations, it forms one of the most valuable of our grasses, growing readily on many soils, shoots early, and affords, from its tufted growth, an early bite for sheep, and produces an abundance of sound, healthy seed, which is easily gathered. The general complaint of running up the coarse stalks may be remedied by early and close grazing, and when sown on poor lands along with other perennials, it will produce the earliest feed; and if the soil be damp and soft, also the most succulent herbage during the season. The quality is much improved

by cultivation and by the propinquity to other plants, preventing the overspreading, and by closely feeding the stems. The merits of the grass on these lands claim much attention, as it is much relished by all kinds of grazing animals.

The produce of cocksfoot grass at the time of flowering was found to be 27,905 lbs. an acre; and when the seed was ripe, 26,544 lbs., and the lattermath 11,910 lbs.; the nutritive qualities of flowering and ripening differing little, and that of the lattermath being about one-half. The grass at flowering is, in value, as 5 to 3 of the lattermath, and the ripe grass to the flowering as 7 to 5. The lattermath is very abundant, which shows the prolific quality, and the produce gains nothing by perfecting the seed; 1,920 grains of the leaves yielded 80 grains of nutritive matter, of which 100 grains gave 59 of mucilage or starch, 11 of saccharine or sugar, and 30 of bitter extractive or saline matter. It flowers in June, and perfects the seed in July, but much later if grazed in the spring; when sown with other grasses for hay and pasture, it may be used at the rate of one or two pecks an acre, according to the quality of the soil, and the quantity of the seeds of the other plants. Cocksfoot likes a moist soil. A hard dry clay, and a total absence of clay, are equally unsuitable. It thrives much in damp situations and in orchards.

This grass is not eligible for hay: the stem are few, rise high, and are harsh and coarse. The only quality is an early herbage of leaves on the tufted hassocky roots, and that only on damp soft lands. The fourth assignment of utility, is a full award of its merit.

FOXTAIL GRASS

Is very abundant in many parts of Britain, and in others scarce or wholly wanting. It rises in erect smooth culms, leafy, and from one to two feet in height; leaves smooth, flat, glaucous; upper ones rougher, very short, with long, furrowed, slightly swelling sheaths; spike soft, about two inches long, dense, erect; most of the flowers stalked; seed-cup awned at the base; awn geniculated, twice as long as the flower, and naked; root fibrous; seed ovate: it is sometimes found awnless.

This grass is very early in growth, being the first that is unsheathed, except the sweet-scented vernal grass, which it closely succeeds; it is easily known in the meadows by the soft woolly spike on a long stalk, when no other grass has appeared. It is adapted for moderately moist lands, and extremes of wet and dry soils are adverse to its growth. From being found in great abundance in many of the best meadows and pastures, it has been much esteemed and recommended as being superior to most grasses in the three requisites of earliness, quantity, and quality, and that the seeds are easily collected and the stems prolific. The quality in respect of nutritive matter is superior to many grasses; the quantity of produce is much exceeded by others, and it is too much confined to one place of growth to admit a general and valuable utility. A large portion of the seeds are constantly destroyed by the larvæ of a species of muscæ, and in many spikes scarcely one is found perfect. The seeds are very scarce and dear, and light and very

difficult of separation for the purpose of sowing, and except on very soft damp lands, almost approaching to watered meadows, little success has attended the use of foxtail grass in the alternate husbandry, or for pastures. In many instances, no plants ever vegetated; the shyness of growth, and the uncertainty of vegetation, exclude the use of this grass in the alternate husbandry: for permanent meadows it is more adapted, as it requires time to come to perfection, and from sending up shoots from the spreading root, one objection is removed, and the bareness of seeds is thought to be obviated by allowing the first culms of the season to bring the seed to maturity. For permanent purposes it requires good encouragement in the quality and preparation of the land, and a damp softness of composition, and at the same time a considerable degree of adhesiveness of texture, and in the most favourable situations a portion of the seeds never vegetate. For the essential purposes of the farmer—quickness of growth and abundance of produce in the greatest variety of circumstances—the foxtail wholly fails in competition with ray-grass, fescue, catstail, and cocksfoot, either for hay or for some years in pasture. If it was sown singly, or along with others, in competition with any of the above grasses, under the ordinary circumstances of cultivation, and on soils from the watered meadow to the scorched sands, the inferiority would be at once apparent and decisive. The great recommendation has proceeded from favourable situations, and from too limited comparisons, the great fault that almost invariably attends the introduction of any article for a general use. The quantity of seed is 4 lbs. to an acre.

The produce of an acre of foxtail grass at the time of flowering is stated at 20,418 lbs.; when the seed is ripe, at 12,931 lbs., and the lattermath at 8,167 lbs., which bears to the flowering crop the value of 4 to 3, and the ripe crop the value of 8 to 9; the quantity of nutritive matter in the ripe crop and the lattermath is nearly equal, and about double that of the flowering crop; 1,920 grains of leaves yielded 96 grains of nutritive matter, of which 100 gave 64 of mucilage or starch, 8 of saccharine matter or sugar, and 28 of bitter extractive or saline matter.

The foxtail grass is strictly perennial, shoots readily, and grows abundantly where it fairly holds; and the lattermath is very abundant, but it must be confined wholly to permanent purposes, and under the very best encouragement and cultivation. It flowers in May, and throughout the summer, and ripens in June and July.

DOGSTAIL GRASS

Is a plant of great value on all dry hard soils, and is found in the very best and soundest of our pastures. It rises in erect culms, about one foot in height, mostly cylindrical, striated, leafy, from a perennial, fibrous, tufted root; leaves linear, acute, smooth; spike obtuse, straight; a variety has been found with four rows of spikelets.

This grass is chiefly adapted for arid soils and open grounds, and on all poor lands it is one of the most valuable of the grasses yet known. The foliage is small, and also rather late in rising in the

spring; the wiry stems are refused by cattle, and become very unsightly, and from the smallness of produce, and from the plants forming dense tufts at the roots, it is unfit for the alternate husbandry; but for pastures, and for all permanent purposes, if the land be of a dry and hard nature, and rather inferior quality, and if sheep are to be fed on it, this grass must form a principal part of the mixture of seeds that are sown for that purpose. It is certainly not suited for low, swampy situations, or for irrigation; but on all the poorer clays, chalks, and gravels, especially on the former, it holds the first place, and often covers the ground, and affords a bite where every other grass has nearly failed. An acre is stated to yield at the time of flowering 6,125 lbs.; when ripe, 12,251 lbs., and the latter-math 3,403 lbs.; the nutritive matter in the first crop being nearly double that of either of the two last, which are the same, and are to the flowering crop in value as 10 to 17; 1,920 grains of the leaves give 83 grains of nutritive matter. It is difficult, almost impossible, in many situations, to keep down the wiry culms of this grass by any mode of grazing; the scythe is often applied; but that fault, if it be any, is amply compensated by the

grateful herbage it affords to sheep, on soils and in seasons where any other grass can with difficulty exist. The quantity of seed is 4 lbs. to an acre.

For permanent purposes, some few grasses are added to the six plants that have been described: as poas, bromes, and oat grass; but in small quantities, and with an indifferent prospect. The grasses that have been mentioned constitute the few useful plants, and must be varied in the quantity of seed according to circumstances. The descriptions now made have been derived from a very extensive experience of a long and varied duration, on soils of many qualities and under very different climates. The statements are conveyed in terms wholly devoid of scientific verbiage and of chemical nomenclature, in order that the comprehension may be easy, and the prospect simple and plain. Unless this provision attend such statements, the labour is useless, and the trouble a waste of time. The writer could have burdened his experience with botanical language equal to Smith and Lindley; but for farming purposes, it is just the thing to be avoided. He hopes that the practitioner will be pleased.

J. D.

LONDON, OR CENTRAL FARMERS' CLUB.

DAY OR PEACE-WORK?

"It is often said that we come here and talk about what every practical man knows. I believe if gentlemen who carp at our discussions would come amongst us, they would find that their attainments in agricultural knowledge are not quite so transcendent as they imagine, and that a great deal of information on a variety of subjects connected with their calling may be gathered from the business men who frequent this Club. One great advantage in the discussions is, that although we may not advance anything new, and although we may fail in proposing or recommending the best system, the whole agricultural mind is turned to the subject, and our sayings and doings are thoroughly canvassed by the practical, and very often by the unpractical, in their private coteries, or at those discussion forums—the market ordinaries." So said Mr. Charles Howard, of Biddenham, Bedfordshire, in the opening sentences of a paper he had been called upon somewhat suddenly to prepare for the Central Farmers' Club. The agricultural world, however, would seem hardly to warrant the word of censure implied in the first part of our extract. His own case, indeed, offers an instance to the contrary. When Mr. Howard kindly consented to aid the Committee in their hour of difficulty, he had all the leading farmers of the kingdom with him. As he himself says, the popular notion that farmers are bad correspondents is a most fallacious one, as he had "very prompt replies from nearly every one to whom he wrote." And with excellent judgment he wrote to the picked practical men of England and Scotland; so that

the carpers and sneerers, wherever they be, can have had but little effect so far on the value of these monthly meetings. The discussion, in fact—in open defiance to one of the rules and regulations—was *not* confined to members of the Club. Making Mr. Howard their mouthpiece, many gentlemen who had never set a foot in Bridge-street still gave their experience and opinions under the sanction of the Society. This excellent practice is now coming much to prevail in the proceedings. The command of some such similar correspondence was obtained by Mr. Fisher Hobbs and Mr. Scott Burn, in their several addresses towards the close of last year, and with all advantage to the subject and object. Even in these times of short journeys by rail, and shorter answers by telegraph, many a friend in the country will write when he will not come, and of the two, perhaps, prefer putting his notions upon paper to delivering them in person. Now and then a lecturer will be so well up in his case as to require but little support from others; while, on the other hand, there are many questions which cannot be properly treated without collecting and comparing the evidence of different districts.

Mr. Howard's theme was one of these. The moral condition of the labourer has, both in and out of the Club, been very well argued of late; and the aim now was to take the workman from a yet more directly practical point of view. What was his work worth? Or, which was the best way to employ it? On this Mr. Howard gathered the evidence of his brother farmers from all parts of the kingdom, and from all the

best authorities. The result is one of the most valuable and thoroughly useful essays that has ever yet been published. We do not say at the London Farmers' Club. We would confine the excellence of this paper to no such limit, but we would offer it to the private coterie and more open forum as one of the best of its kind. At an era in our history when labour is at length duly recognized as one of the heaviest and most indispensable items in the farmer's outlay—at a time when this labour is gradually becoming more difficult to command—and when the labourer needs more intelligence and skill as he insists on better wages—with such a growing difficulty before us, what are we to do to meet it? The answer is, to teach a man to rely more upon his own exertions—to let him feel that the more he improves himself in his handicraft the more will he profit by it. The days are gone when the master kept so many men "on" simply because he was compelled to keep them, and was content to see them dawdle through the worst possible day's work at the worst possible day's pay. He the rather wishes them to do all they can and as expeditiously as they can. Land must be worked, corn must be cut, and seed must be sown just at the nick of time. This is now known to be half the secret. While the companion secret, or the other half of it, is to train men to be ready, sharp, and clever.

Mr. Howard and his many friends whisper this in a word to us—It is piece-work. And straightway Messrs. Sneer and Growl and Grinn echo to each other, "Who didn't know that?" However well known, it is curious to see that the system is rather going back than coming on. Despite such examples as the drill, the reaper, or even the steam-plough being let to the labourers, there is not so much work done by the piece as formerly. And the reason is *not* precisely that Mr. Howard seemed to dread when he undertook the subject, or that Sneer, Growl, and Grinn would be so ready to give us. Piece-work is often found to be expensive; and when so, its costliness generally arises from the masters not really knowing what work is worth. They are not competent to deal with the men, and prefer returning to the so many shillings a week; a state of circumstances under which an able man takes pretty good care that he shall not be of more value than a bad one.

That "we come here to talk about what every practical man knows," will scarcely be the comment upon this paper. On the contrary, we believe that the practical man, above all, will read it with pleasure and advantage, while "the prices" of different districts will put many a man right as to what he should pay and what he should have. In almost every other kind of employment piece-work is the rule, whereas in Agriculture it is the exception. Where it is so, the tone of this discussion goes to assure us that it mainly arises from either the master or man not knowing their own business or what is best for themselves. In a word, the employer would have his work done better and quicker; while, as to the labourer, we hear from all sides that his condition should be improved. He

should be better housed, he should be better fed, he should be better paid, better educated, and so on. Let us attempt to make this no matter of charity, but simply allow him the chance to do it all for himself. The more skilled he is to manage modern machinery, and the more energy he gives to his task, will all duly develop in greater comforts and a higher position, when a man is estimated and paid, as he should be, by the work he can do.

The subsequent discussion, though by no means equal to Mr. Howard's admirable opening, will still well repay a careful perusal, jotted as it is here and there with useful hints and practices. One rather amusing incident occurred in the course of these after-proceedings. Mr. Frere, the new editor of the Royal Agricultural Society's Journal, in thanking Mr. Howard, observed that, although the whole of the Paper had not been read, he trusted that the committee of the Club would allow it at once to appear in the newspapers. Whereupon Mr. Sidney, in supporting the suggestion, remarked "that it was not the practice *here* to keep information of any value out of the papers, or to bottle it up for six or eight months until it was next to useless"—an observation put with such point as to cause a shout of laughter, in which "the editor" had to join, too palpably at his own expense. Mr. Howard's address of course appears in its entirety.

DAY AND PIECE WORK.

The Monthly Meeting was held on Monday evening, March 4, at the Club House, Blackfriars, Mr. Skelton presiding. The question fixed for discussion was, "The several merits of day and piece work;" but no name was affixed to it on the programme of subjects for the year. There was a very good attendance of members, most of the leading districts being represented.

The CHAIRMAN, in opening the proceedings, said he was happy to be able to state that the appeal which he made at the last meeting as regarded the enrolment of new members had been well responded to. There had been several additions, and he hoped that by the end of the year the number of members would be nearly doubled. As regarded the subject for discussion, to which no name was attached on the card, he was happy to say that Mr. Charles Howard had, at the request of the Committee, kindly undertaken to introduce it. He had another announcement to make relating to a matter of some interest to the members generally. The landlady of that house having retired, the Committee had that day had an interview with the incoming landlord, and there appeared to be every prospect of the members being well attended to in that establishment. The landlord had told the Committee that he was most willing, and most anxious to give all the members who might come there the greatest possible satisfaction.

Mr. C. HOWARD said: Mr. Chairman and gentlemen, the Committee of the London Farmers' Club having been disappointed by the gentleman who was proposed to introduce the subject on the card this evening declining to do so, unanimously requested me to bring the subject before you. I should have preferred a longer notice than three weeks; however, as the Club appeared to be in a fix, I waived the shortness of the notice, and very willingly came

to the rescue, simply asking you to be lenient in your criticisms, for the reasons I have stated. I the more readily introduce this subject, inasmuch as it is one that has not hitherto had the attention of the Club drawn to it, nor has it perhaps been so much discussed by the agricultural public or the agricultural press as its importance would seem to demand. At the same time, I do not flatter myself that I am about to advance anything new; indeed, this is very difficult upon any subject, much more so in one of the character we are met this evening to discuss. I have often heard it said that we come here and talk about what every practical man knows. I believe if gentlemen who carp at our discussions would come amongst us, they would find that their attainments in agricultural knowledge are not quite so transcendent as they imagine, and that a great deal of information on a variety of subjects connected with their calling may be gathered from the business men who frequent this Club. Labour has ever formed an important item in the cost of farm operations; but at the present day, when so much stock is reared, such large crops are produced, and so much machinery is employed, the balance-sheet shows that labour, upon the well-cultivated farm, forms the largest item of expenditure; therefore it appears to me the time of the Club cannot be better occupied than in considering what is the best mode of paying for that which constitutes so large a proportion of our outgoings. In the short space allotted for the discussions, I cannot travel over the wide field of inquiry which the subject suggests, but merely glance at a few of the more prominent features of the question. One great advantage in the discussions of this Club is, that although we may not advance anything new, and although we may fail in proposing or recommending the best system, the whole agricultural mind is turned to the subject, and our sayings and doings are thoroughly canvassed by the practical, and very often by the unpractical, in their private coteries, or those discussion forums—the market ordinaries. But, whatever may be the opinion of parties outside, I am quite sure they will agree with me, that the want of knowledge as to the best mode of directing labour, and of the value of the various operations in husbandry that manual labour has to perform, has been the cause of many a good man's downfall. Whatever may be the relative merits of day and piece work, nothing will compensate a farmer for want of a practical acquaintance with how much work a man can do in a day, and the quality of that work when finished: hence the desirability of young men thoroughly acquiring a knowledge of the various operations of the farm. A man may ask his neighbour what he ought to pay for a particular description of work, but if he is no judge of that work when finished, although he does not suffer by parting with too much money, in all probability he will pay dearly through the inferiority of the work. On entering upon the several merits of the day and piece work, I may observe that a farmer is far from being so advantageously placed as the manufacturer in letting his work by the piece, inasmuch as it is impossible for *all* the work of the farm to be performed on that system; a great deal, such as the feeding and tending of stock, carrying corn to market, and many of the field operations, cannot be done otherwise than by the day. Again, the farmer has to contend with the elements; and, if ever so disposed to keep his men at piece work, the weather frequently prevents him. Again, some farmers are situated, like I am myself, with a good and well-conducted set of men, whom he is disposed to keep all the year through; and at certain seasons, when work is not very plentiful, there is no inducement to the farmer to set his

men to piece work, which would have the effect of raising his weekly expenditure. Still I think the system might be advantageously extended; for I find upon farms where piece work is generally adopted the work of the farm is always in a more forward state than where the day system prevails, the men are better off, they are more active, and more skilful. It is a well known fact in the commercial and manufacturing world that those trades have been the most successful, and have made the greatest progress, in which piece work has been the rule; and I think this may be partly accounted for on the ground that the men feel an interest in facilitating the various operations upon which they are employed: the energies of their minds are also bent upon finding out easier and quicker methods of getting over their work. Put a set of men by the piece, at once a rivalry is felt as to who shall do the most work, or, to use their own words, be the "best man." If there is any rivalry amongst a company of day workmen, it is too frequently as to who shall do the least, and, in many cases, who shall best deceive his master. Piece work, too, is the readiest way of making a difference between the good and indifferent labourer; and the plan adopted by many masters who wish for it to be the rule, is to pay a comparatively low price by the day, in order to induce their men the more readily to take work. In treating this subject I have thought it desirable to adopt a course always favourably received by the Club, viz., that of collecting evidence from various counties of the systems pursued in each, with the prices paid for farm work; and before commencing to read the correspondence, I will just allude to the popular notion, that farmers are bad correspondents. I have found this idea a most fallacious one, having received very prompt replies from nearly every farmer to whom I wrote for information; and I may add that every letter is worthy of entire publication. I find that most of my correspondents strongly recommend piece work where practicable, and consider it would be beneficial both to the employer and employed if it were considerably extended. In the northern part of England and in Scotland, I learn that there is not much work done by the piece, in consequence of the practice of having yearly or half-yearly servants—a mode of hiring which meets with little favour or success in England, although north of the Tweed it seems to be approved. A correspondent, writing from West Shropshire, states: "In the way of hiring farm-servants, we have sad work every year—men hiring for the year leaving just before their valuable services are wanted, and if taken before magistrates, little redress can be obtained. The way I would presume to suggest, would be hiring upon the sliding scale, as a general rule amongst farmers. Thus: A man at £12 per year should have for November, December, and January one-half; February, March, and October three-fourths; April and September full share; and the remaining four months the wages increased to the amount deducted from the short days before mentioned. This plan, I feel sure, could not be objected to by any honest, well-meaning servant." In most of the counties of England it is carried out to a considerable extent; and the operations by the piece are hoeing of corn and root crops; filling and spreading manure; mowing grass and seeds; washing and shearing sheep; cutting, carting, stacking, and thatching of corn; laying and trimming hedges, ditching, draining; mangold pulling; turnip cleaning, heaping, and covering; cutting haulm, and thrashing Lent corn. I have made *particular* inquiries on the important subject of harvesting; for, since the introduction of

reaping machines great changes have been effected. I hold that too much discussion cannot take place upon this point; for, with the exception of last harvest, much difficulty has been experienced throughout England in getting the corn cut at a proper time, and therefore considerable loss has been entailed upon the farmer. If through this discussion the best method can be arrived at, or settled, our time will have been well spent. My own opinion is, that to let the whole of the cutting, carting, and thatching to a company of men is the best: it has been adopted by several of my friends, and to their entire satisfaction. There is one gentleman in my own immediate neighbourhood, whose name is now well-known throughout the country in connexion with steam cultivation, who adopts this mode of harvesting. He is a most practical man; and no one in our county gets more work done for his money. I will, if you will allow me, read you extracts from my correspondence, and begin with my own county, taking first the letter of Mr. Pike's, of Stevington, the gentleman to whom I have alluded. He states: "I let my harvest as follows: I agreed with seventeen of my own men to cut, cart, and stack the whole of my corn at 11s. per acre, with four pints of beer per day, to be cut close to the ground and all tied, viz., 100 acres of wheat, 60 of barley, 14 of oats, and 60 of beans. I agreed to find boys for carting and to horse-rake it; they tie and cart the draggings; the thatching is done at 1s. per acre. Former years I let them the thatching by the square; that did not answer, as they made too many stacks, by not carrying them high enough in the walls. With regard to using the reaping machine, they agreed to allow me 3s. per acre for the use of it and horses. By adopting the plan of letting the whole harvest, I have very little trouble with men or boys, for I find if they do not get on fast enough, they can get hands when I could not. One great advantage of cutting close is, that I get my land ready for breaking-up by steam for tares, mangolds, beans, &c. I have all hoeing done by the piece; dug carting I generally let by the lump—that is say, so much to fill and spread such a heap to go over so many acres, or so much for emptying a yard. One job I am anxious to have done by the piece—that is, the steam cultivating, which I think would be a great advantage, as it is so different from ploughing with horses: long days do not distress the engine. The only objection to piece-work in short days is, the desire of the men to make them shorter; if they are allowed to come late and leave early, the day men, whom we are obliged to have to look after the stock, become dissatisfied." Mr. Pike will derive some information from this discussion, as he will find, from letters I shall shortly read from Lincolnshire, that the plan of letting steam cultivation by the piece has been adopted by two practical men. The next letter is from Mr. Horrell, of Oakley, who occupies one of the principal farms of the Duke of Bedford. He states: "In this district, with the exception of draining, piece work is confined chiefly to the spring and summer months, such as hoeing wheat, beans, peas, and turnips, for which I pay as follows:—beans and peas per acre, 3s. 6d.; wheat from 3s. to 3s. 6d.; turnips, at 27 inches apart, setting out and once hoeing, exclusive of horse-hoeing, 6s.; mowing grass from 2s. 6d. to 3s., with allowance of beer. When I commence my harvest operations, I agree with as many men as will be able to cut the corn as fast as I can with another set get it up after them. I consider I can gather in as much corn when tied with one set of men, as I can when otherwise with double the number. I pay the following prices: reaping wheat, from 8s. to 11s.; mowing and tying barley ready for cart-

ing, 6s.; mowing and tying oats, 7s.; mowing barley, 8s.; and bagging beans, 10s. per acre." Mr. Horrell also observes, "that if a farmer wishes to be forward with his work, he must adopt the plan of having it done by the piece, and pay fair wages for the performance of the same, which stimulates the men to greater exertion." The next letter I propose reading is from Mr. Battams, of Carlton—one of our best and most successful farmers, who has recently retired from business, leaving his sons in large farms. He says: "Although I have thrown the plough in the ditch, I will refer to my labour-book, and give you the prices paid upon my farms for piece and day work. I will commence with my first operation, grubbing up about 60 acres of woodland. This cost £8 per acre. It was then drained 4 feet deep, at 2s. 6d. per chain. I next dug with spade 90 acres of old grass, covered with ant hills. This was done at £2 to £2 2s. per acre. It was then drained 4 feet deep, at 2s. and 2s. 3d. per chain. The old ploughed land was drained the same depth, and at the same price, except where the pickaxe was used. This cost 3s. 6d. to 4s. per chain. The above was extraordinary farm work. I had more than 100 men employed at one time, my sons superintending the work; it was done well, and the men earned 12s. to 15s. per week, and some even more, in the winter months. I now come to ordinary farm work, done by the piece: trimming hedges, 2d. per chain; singling turnips, and hoeing the side of the ridge after the horsehoe, 5s. to 6s. per acre; topping and pitting turnips, 6s.; mangold wurzel, singled by the day, and for pulling, topping, and placing in rows for carting, 3s.; bean dibbling, 2 ft. apart, when the rows are marked out, 3s. 6d.; if unmarked, 4s. 6d. per acre; hoeing ditto twice after the horsehoe, 6s.; mowing clover 2s.; mowing grass, 2s. 6d. to 3s. per acre, with 3 pints of beer per day; mowing, sheafing, raking, and shocking wheat, barley, and oats, 7s. to 8s.; pea hooking, 4s. 6d. to 5s. 6d.; bean hooking, 7s. 6d. per acre, with 4 pints of beer per day; thatching, 1s. per square of 100 feet, with beer; harvest carting, 3s. 6d. per day; ordinary day labour, 11s. per week; men attending the steam engine, 15s. per week, with beer; horsekeepers and shepherds, 12s. per week, with house and garden rent free. I think it desirable to have work done by the piece where practicable; but I find three-fourths of the ordinary work of the farm is performed by the day, and I cannot well see how it is to be avoided, with so many men attending stock, and the thrashing, chaff cutting, grinding, and a great part of the cultivation of land done by the steam engine; but even this day labour may be done very satisfactorily, where a good feeling exists between the master and the men, the former devoting sufficient time to the superintendence of the workmen." Mr. Battams adds, "I have not noticed the cost of paring and trimming old grass land, as I think the necessity of doing it almost exceptional. I prefer double ploughing; what I have burnt cost £2 an acre." Mr. Battams ask me how I purpose to make use of his name, and goes on to say: "Recollect I am an old fellow. Seeing the candle coming to an end, rather than flicker in the socket, I thought it better to light others, that I might see how they would burn before I was quite extinguished. I have had 38 years of farming, and I shall now be content to see my sons, who are all farmers, go a long way a-head of their father." Mr. Battams has pursued a wise course. He knows what a great many farmers, who have grown-up sons, do not, viz., *when to leave off*. In our county, you are all aware the Duke of Bedford has a very large, and, I may add, exceedingly well-managed estate, upon which draining has been carried out to a very large

extent, and in the best possible manner. The whole of the work, as far as possible, is done by the piece. The prices are regulated by the value of day labour in the district, and by the nature of the ground. The drains average 4 ft. to 4½ ft. In good free soils this work is done at from 6d. to 8d. per pole, and the men will earn 13s., 14s., and 15s. a-week. The land belonging to the Duke, in the northern part of the county, is of a much stiffer nature—a blue clay, mixed with chalk stones and gravel. Here the draining costs from 9d. to 1s. per pole. The men expect to earn more money, as it costs them more for tools. They earn from 2s. 6d. to 2s. 8d. per day, and this in the winter months. The men are allowed to draw the usual day's pay of the neighbourhood, and are generally settled with once a month. The gentleman to whom I am indebted for this information, and whose opinion is worth having, thus closes his letter: "If a man works honestly and fairly, I think he is well entitled to the 6d. or 8d. a-day more than the ordinary day's wages; and if he has 2s. 6d. or 3s. per week clear after paying for his tools, it is a great help to the labourer, and costs the employer no more, and perhaps less, than if done by the day." On the estate of the late Earl de Grey, now Lady Cowper's, under the very able management of our friend Mr. Trethewy, a great deal of draining has also been carried out. Mr. Trethewy has favoured us with the prices, and he states: "For draining I give from 5d. to 9d. per pole, for 4 ft. work, and provide a man to lay the pipes. I pay the latter by the day, and give him the control of the work, after it is set out. For 3 feet deep I give about 4d. per pole, with a foreman, as in the other case; main drains from 9d. to 1s. per pole, according to circumstances. For planting new quick, forming table and ditch with single row of quick, and fencing, 5s. per chain; with double row of fencing, 1s. more; for laying fences, 6d. to 8d. per pole, according to ditch, &c.; trimming or 'swabbing' quick fences, when kept under the hook, 1d. per pole." From Norfolk I have been favoured with letters from Mr. Hudson, of Castle Acre; Mr. Clare Sewell Read, of Plumstead; and one other gentleman, in another part of the county. Mr. Hudson says: "There is not so much piece work done on the farms in this district as in former times; but we prefer that system when the men will take the work. The drilling is done by the acre. The man who leads the horse, and the man who guides the drill, are paid each 3d. an acre, if the work is done well; they earn about 3s. a-day each. Fencing is paid for by the rod of 7 yards, at from 9d. to 1s. a rod. The manure is filled by the load, at 1½d. per load; manure heaps turned over at 1d. per load. Turnips are hoed out at 2s. per acre, and singled by hand at 1s. 6d., and hoed round each plant at 3s. an acre, besides being horse-hoed three or four times between the ridges. Clover is mown at from 2s. to 3s. 6d. and 4s. an acre. The harvest work is taken by the men on the farm, who cut the barley and oats, and pitch, load, and stack the whole of the crop, including wheat, at from £6 to £6 10s. per man, the wheat being cut by machines, and tied up by women, at from 2s. 6d. to 3s. an acre, according to crop. Rix's gathering rake is of great use in getting the wheat into sheaves, ready to tie up. Barley is gathered and heaped at 6d. an acre. In the autumn the swedes are placed in rows of from six to eight drills together, at 2s. 6d. an acre. If topped and tailed, and loaded on carts, or heaped ready to cover up, 4s. an acre. Stones are gathered from the clover layers, and put at once on carts, instead of being laid on the ground in heaps, at 1s. per load of 24 bushels. Hay stacks are thatched at 4d. a yard run at the eaves; corn stacks, at 5d. per yard run.

Thrashing is done by steam power, the dressing by hand; The men earn from 11s. to 15s. a-week." Mr. C. S. Read writes: "Piece work is *not so common* as formerly, because it cannot be done so cheaply as it could a few years ago. Not only do farmers pay more for mowing, hoeing, &c., but the rate of wages is quite a shilling a-week higher than it was ten years ago. Draining, ditching, and the like, are generally piece work; also, muck-filling and spreading in one way or another. Harvest is invariably managed as follows: a certain number of men and boys are hired, and they get in the harvest: the harder they work, the sooner it is done, and of course the more they earn. Wages have been £6 for an able-bodied man lately, and the harvest averages under a month, being often ended in three weeks; but this year it was nearly five. Where reaping machines are extensively used, I think an alteration may take place in the mode of harvesting the corn. On some farms, already the men are paid per acre for tying and carting the grain; and many farmers, to popularize the machines, have hired their usual staff for harvest, and given the men the use of the machine. The harvest costs from 10s. to 14s. an acre, including everything." In reply to my inquiry about the letting of ploughing in Norfolk, Mr. Read adds: "Very little ploughing is done by the piece, certainly not with horses; but many farmers put out ploughing to their bullock men, the bullocks being changed four times a day, and four bullocks being allotted to a plough, the price varying from 1s. 2d. to 1s. 8d. per acre, the depth and stiffness of the land, of course, regulating the price. I am in favour of well-paid piece work, and a comparatively *low price for daily labour*; if your day's pay is high, the men do not like to take piece work, and having piece work is the only way we can make the proper difference between the good and indifferent labourer." In East Norfolk, the farms being smaller than in the west, there is not so much piece work done; but where carried out, it is at about the same prices as stated in the foregoing letters. It appears that not so much work is let as formerly in Norfolk. I have no doubt it is for very good and sufficient reasons. I have received a number of other lists of prices paid in several counties for the various descriptions of farm work. I shall not burden the Club with a detail; but I thought the opportunity a favourable one for collecting such information; and, as it will appear in the Journal of the Club, an opportunity will be afforded to those who feel interested to compare the prices they pay with those paid in other districts. The letters I have received are full of valuable matter, but I purpose giving only such parts as appear to me to bear directly on the subject of my paper. From Lincolnshire I have been favoured with communications from Mr. F. Sowerby, of Aylesby, near Grimsby; Mr. Dring, of Claxby, near Spilsby; and Mr. John Algernon Clarke, of Long Sutton (all names well known throughout Lincolnshire). Mr. Sowerby's is rather a long letter, but it contains a great deal of information. I will condense it as much as possible. He states: "I am quite in favour of having work done by the piece where practicable. For the last few years I have let my manure to fill at 1½d. per one-horse cart-load; mowing seeds at about 2s. 6d., grass at 3s. per acre; swede turnip and wurzel hoeing at 7s. per acre twice over, and every subsequent time, if necessary, 1s. per acre extra; hoeing white turnips 6s., twice over—I believe this is rather a high price than is generally given for hoeing, but I hold it is poor economy to give a low price. Harvest work is always done by the piece, that is, cutting and making ready for the waggons; we reap very little in this part of Lincolnshire, nor do we use many

reaping machines. Our people principally work in families; our prices have averaged the last few years upon our large farms from 8s. to 10s. per acre, viz., to mow, tie, rake, and stook. Many farmers have, of late years, let the pitching to the waggons at 6d. to 8d. per acre; also, the pitching from the waggon to the stack at the same price. Thatching is done at 1d. per yard; draining 3ft. 9in. deep, upon a strong clay bottom, 2s. per chain; topping, tailing, and heaping mangels and swedes, from 6s. to 10s. per acre. I said before, I am quite in favour of piece work; the men will earn from 6d. to 1s. per day more, and be cheaper for the farmer. I believe I may say, we have a very fair lot of men in Lincolnshire, but there is nothing like giving them an interest in their work. I have worked my steam-cultivating apparatus to great advantage this last year by the piece; I considered 5 acres with the narrow, and 7 acres with the wide implement, per day, upon strong land, a fair day's work, including shiftings; but, by the piece my men have done considerably over the above quantities. I give them (five men) 2s. per acre when using the wide implement, and 3s. per acre when using the narrow one; and we have averaged 7 acres with the latter, and 10 acres with the former per day. I consider this is very important, as we can only work this implement a limited number of days in the year. I am very glad to say I am well satisfied with my cultivating apparatus; I think it one of the greatest improvements of the day. I am now working 16 horses, instead of 22, and those working much easier than before; and what is more, steam does what horses cannot do upon strong land." Mr. Dring observes: "From my experience the subject for discussion at the Club is of great importance to farmers: piece work is best for the labourer, as it gives him a greater interest, puts him on his mettle, and is somewhat a preventive to idle habits." He goes on to say, "We have too much done by the day, and too little by the piece, in this district." The prices paid and system pursued are much the same as stated by Mr. Sowerby. Mr. Dring also works his steam cultivator by the piece at 6d. per acre per man. He says: "This enables me to do a greater quantity in a given time; if not attended to with energy after harvest, the game is lost." He closes his letter with the following remarks—"Piece work is most important for the following reasons: better cultivation, obtaining greater crops is now the order of the day; this can only be done by an extra amount of labour per acre: therefore our object as farmers is to get ten men's work done by eight men, and not eight men's work done with ten men; we wish to give an inducement to get more work done; this will be accomplished by piece work. For example, I am now stubbing up a wood, and shall convert the land into tillage, which costs £9 per acre; if I had this done by day work I believe it would cost nearer £20 per acre. By the latter system I should make labour more scarce; scarcity of labour is equal to dear money." Mr. J. A. Clarke writes: "In this neighbourhood (the marsh district of Lincolnshire) only a portion of the men are hired for the harvest at 18s. to 25s. per week for carting, &c., the largest proportion of labourers working by the acre at prices varying with the condition of the crops, and the quantity of imported labour; mowing and raking white corn at from 9s. to 21s.; cutting wheat averages 12s. to 13s. per acre. Draining with thorns is common, and answers well on our sandy, silty subsoil, and very cheap, costing 10d. per 24 lineal yards, the farmer finding thorns and stubble: men earn 2s. 3d. each per day. Surface gripping, hedging, and ditching, are also performed by the piece, at prices varying from the nature of the work.

Manure is turned over by the piece at so much the whole yard." The other prices given in Mr. Clarke's letter are about the same as other districts. Mr. Clarke concludes by saying, "You cannot praise piece work too highly, but there are many operations in farming in which it is highly impracticable." From Yorkshire, Mr. Peter Stevenson, of Rainton, near Thirsk, states that "nearly all the labour is done by the day, with the exception of mowing corn and grass; 50 per cent. also of the turnip hoeing is done by the day. Since the introduction of reaping machines much of the harvest work has been done by the day, that was formerly done by the piece. The prices paid for mowing, binding, and stooking wheat, oats, and barley, 8s. to 11s. per acre; mowing grass and clover, 8s. 6d. to 4s.; singling turnips first time, 4s. to 5s. 6d., twice over 7s. to 8s.; pulling and topping mangolds 7s. to 8s.; draining stony ground 4 feet deep, 2s. 9d. per chain." After giving the day wages, viz., 12s. per week, Mr. Stevenson adds: "I am of opinion that many more operations of the farm might be done by piece work advantageously; but the labourers are generally unwilling to work by 'piece.'" Mr. T. P. Outhwaite, of Goldsboro' House, Knaresborough, says, "he prefers every description of work, when possible, done by the piece; but there are difficulties in districts where men are not accustomed to it; the greater part of the harvest work used to be done by the scythe, at prices varying from 7s. to 16s. per acre; much is now being done by reaping machines, which are rapidly increasing; he has worked one on the Hussey principle eight seasons, which he has improved. Some of his neighbours let their binding after the machine, which costs 6s. per acre for a 30-bushels an acre crop of wheat, 5 qrs. of barley, and 7 qrs. of oats. Draining four feet deep costs 8s. 6d. per chain; five feet deep, 4s. 6d. per chain: the land is stony clay. Topping and tailing swedes 7s. per acre; mangolds 10s." Mr. Outhwaite uses an implement for taking off the roots, which it appears saves him 2s. 6d. an acre in getting up swedes, and 8s. 6d. in mangolds, as his price is 4s. 6d. for swedes, and 6s. 6d. for mangolds. Mr. Outhwaite further states, that "owing to the labourers going into the mining and manufacturing districts, labour has considerably advanced, and without the best farm implements and machinery are employed, it is impossible to get the work properly done." From Northumberland, Mr. T. P. Dods, of Anick Grange, Hexham, states that "only the extra work is done by the piece, the regular work being performed by either yearly or half yearly servants." The system and cost of harvest operations appear to be very much as in other districts. Draining three and a-half feet deep costs 8d. to 1s. per rod of seven yards. Mr. Dods concludes by saying, that "a great many of the farm operations might be done by the piece which are done by the day. The turning and filling of manure heaps, the forking of hay and corn to the carts, cutting and cleaning of hedges, &c. Both for the sake of getting the work more speedily executed, and that the men may earn a little extra, I think we should do more by the piece than we do." Mr. Francis Twining, of Parbold Hall, Wigan, Lancashire, states: "Almost all work in this district is done by the day: wages are from 14s. to 16s. a week; mowing seeds (clover and ryegrass) from 4s. to 6s.; shearing wheat 14s., cut close—say, five-inch stubble, set-up and hooded by a man found by the farmers; barley mown, tied up, and raked, 11s.; oats mown, tied, and raked, 12s.; and beans, 12s. per acre. Draining four feet deep, 10d. per eight yards: at this the men can earn about 18s. a week. Getting potatoes grown on the drill, thirty-two inches apart, after being grubbed with the horse-hoe,

2½d. per eight yards, running measure; pulling and cleaning swedes, on thirty-inch ridges, 1d. for sixty yards; mangels, 1d. for fifty yards; turnips, 1d. for eighty yards, running measure. This work is mostly performed by women, who earn 2s. 6d. to 3s. a day." Mr. Henry Humphreys, of Beau Manor Park, Loughborough, states that "piece work is not put into practice so much in this neighbourhood as in my opinion it should be, for the mutual advantage of employer and employed. I have observed, in other counties I have visited, where the labour is executed by the piece, that the work is much more expeditiously performed, and the labourers more active and intelligent; resulting, in a measure, from their ability to earn greater wages. They are better fed and better clad, earning oftentimes from 1s. to 1s. 6d. per day, by the piece, more than can be afforded to the ordinary farm labourer, owing to the regular and limited amount of labour executed in the day system. We are progressing slowly and gradually towards piece-work, and, whenever we can, prefer having the labour done in this way. I give you a list of prices paid upon this farm and neighbourhood, the labourer finding his own beer: Mowing grass 4s., clover 2s. 6d. to 3s. per acre; mowing and tying wheat, from 9s. to 12s. per acre; reaping wheat, 14s. to 16s. per acre. Mowing barley, 3s. to 3s. 6d.; reaping and tying barley, 10s. to 12s.; mowing oats, 2s. 6d. to 3s.; reaping and tying ditto, 8s. to 12s.; cutting and tying beans, 9s. to 11s. per acre. Hoeing wheat 3s. 6d., barley 3s., beans 4s. 6d., peas 3s. 6d. per acre. Hoeing and singling turnips and mangolds twice over, 6s. per acre; raising and dressing swedes, from 7s. 6d. to 9s.; ditto mangolds, 10s. to 12s. We do not allow the roots of mangolds to be cut with the knife. Forking and raising potatoes, from 6d. to 8d.; double digging, from 2s. to 3s. per 100 square yards. Draining, varying from three and a-half to five feet deep, 7d. to 1s. per rod of five and a-half yards. Fencing: cutting down, taking out dead wood, and making strong fence, from 6d. to 8d. per rod of five and a-half yards; trimming fences, 0½d. per rod." Mr. Humphreys concludes by saying there is not any portion of the carting or stacking of grain done in his district by the acre, and expresses an opinion that it would be highly advantageous to all parties if such a system were generally adopted. Mr. G. Shackel, of Erleigh Court, Reading, in a very interesting letter, but which came too late for me to make full use of, considers the subject of vast importance to the farmers. He believes the labourers are not what they used to be, in not taking that interest in their master: hence, the greater necessity for piece work—that it tends to make good labourers. A bad labourer he compares to a bad implement—next to nothing. The same may be said of Mr. S. Druce, of Eynsham, Oxford. From Wiltshire I have been favoured with letters from Mr. J. W. Brown, of Uffcott, Swindon; Mr. W. Sainsbury, of West Lavington, Devizes; and Mr. W. J. Brown, of Hazlebury, near Chippenham. From Mr. Brown's letter, of Uffcott, I learn that the harvest work is generally done by the piece, at about average rates. He advocates reaping his wheat, as it is carted in less time, and costs less to stack, thrash, and thatch. The stubble he gets cut at from 3s. to 4s. per acre, immediately after harvest, and at 2s. 6d. later in the season. Mr. Brown has tied up wheat after his reaping machine at 7s. per acre, but considers it could be done at 5s., if they were generally used in the locality. Mr. Sainsbury states that "at certain seasons, if piece work were not adopted, much of the work of the farm would have to be completed out of season, and contends that it is to the advantage of the country, as well as to the farmer and labourer, that piece work

should be carried out in all branches of agriculture, as far as it is practicable. The average price of reaping is 10s. per acre; allowance for beer, 1s.; tying after the reaping-machine 5s. 6d.; turnip-hoeing twice, being once previously horse-hoed, 8s. per acre, allowance for beer 1s.; mowing oats and barley 2s. to 3s.; mowing grass 2s. to 3s. 6d., with an allowance of one bushel of malt to each man; at the time of harvesting the corn, the men are paid about 4s. per week extra, with beer." Mr. W. J. Brown states that "he regards the subject for discussion of the greatest importance to farmers in general. The largest quarry-master in England told him the other day he always noticed his men, when working by the day, get fat, but quite the reverse when by the piece. Beer is done away with in many places, but not to the satisfaction of the men." Mr. Brown's practice is to send to each of his labourers one nine-gallon cask every three weeks in summer, and every six weeks in winter. If any short time is made, he deducts 2d. per day: he contends this is one of the means of keeping the labourer from where he states every evil is concocted—the beer shop; and he thinks nothing will improve the labouring class like this, and giving him a three-bed-room cottage to live in. Mr. Brown does his reaping with a Burgess and Key's machine. In 1859 he cut 133 acres in nine days; last year he cut 122 acres at about the same rate. His labourers now look upon the machine as a friend instead of an enemy. For tying up after it he gives 5s. an acre, without beer; winnowing and dressing after the machine, 3d. per quarter—a custom he finds answers his purpose. He also thinks there are two things upon a farm you can do too much of in a day, viz., drilling and thrashing, and condemns a finishing thrashing-machine. Mr. J. T. Twynam, of Winchester, has very kindly forwarded me the following list of prices paid for labour in Hampshire:—Mowing and binding wheat 7s. to 8s. 6d., mowing and forking barley and oats 3s. to 4s. 6d., mowing and binding ditto 5s. to 6s. 6d. per acre, *without beer*; mowing mixed upland grass 1s. 10d., clover 2s. 6d., sainfoin 2s. 6d., pastures and water-meadows 3s. 6d. per acre; hoeing turnips or swedes once 6s., twice 8s. to 10s. per acre; dung spreading, where about 12 tons per acre is put, 2s. per acre; cutting and laying quickset hedges 6d. per rod of 5½ yards; making faggots 6d. per acre; banking for the reception of quicksets, when planted 9d. per rod; making dead hedges with coppice wood, two feet high 3d., three feet high 4d. per rod; moving earth per cubic yard 3d., chalk or gravel per cubic yard 6d., with 1d. per rod in addition for every fifteen yards in length over which it may be wheeled. Chalking 30s. to 40s. per acre, according to the depth at which it is found, and wheeling on in barrows from 1,200 to 1,500 bushels (55 to 68 tons) per acre; this chalk is immediately spread, cost included in the price stated, and left to be acted on by the frost. Trussing hay 2s. 6d., ditto straw 3s. 6d. per ton; thatching corn ricks 8d. per square of 100 feet, including all work attached to it, but *not* materials; grubbing up strong hedge-rows or coppices, and thoroughly cleansing the ground, 1s. 3d. to 1s. 6d. per square rod; burning ashes round the borders of farm roads 3s. 6d. per 100 bushels, including paring the turf; breast-ploughing 6s. to 8s. per acre, according to nature of soil; flooding water-meadows, and keeping the water-courses clean throughout the year, 6s. per acre. Stacking hay and corn is done by the day, the men being paid one-third for the former, and double in the latter case, over the usual wages, with one gallon of beer each per day; this mode is considered preferable to task work, as the men are immediately under the control of the employer, which is of great importance while such work is in progress. Thrashing is nearly all done by ma-

chinery, chiefly steam power. Mr. Henry Page, of Walmer Court, Dover, informs me that he puts as much work by the piece as possible, thereby giving the labourer an interest in what he is doing. He finds he gets 1s. 3d. more work done in the day. Harvest work is mostly done by the acre. The wheat fields, being divided into "cants" of about two acres each in the spring of the year, are entered into a book; a man takes a "cant," and with his family expects to earn 10s. per day. The price paid for mowing, binding, and shocking is from 10s. to 15s. per acre. Barley is mown and bound from 6s. to 7s. per acre; the other prices named are about the average of the kingdom. Mr. F. Stoneham, of Crayford, near Erith, Kent, thinks there cannot be any doubt as to the economy of piece work where there is proper supervision; and living as he does in a district of factories and brickfields, the farmer gets the refuse hands, and thinks he saves 25 per cent. in all the labour he has done by the piece. Mr. Stoneham endeavours to cut all his litter for horses and cattle, the cost of which is more than saved in filling and spreading the manure. He pays 1s. to 1s. 3d. per load of 36 trusses; spreading manure from 1s. 6d. to 2s., edge hoeing peas, beans, and potatoes 2s. to 2s. 6d., hoeing turnips twice 10s., cutting corn from 12s. to 20s. per acre. When he uses the reaping-machine, he pays 5s. per acre for binding and shocking. He finds the man who goes with it, and horses and driver. His corn is all carried by the acre, pitching, loading, stacking, and barning, at from 3s. to 3s. 9d. per acre; he binds all his corn, and finds horses and drivers, but no beer for anyone. The men earn from 3s. 9d. to 4s. per day, and are better satisfied than when they were paid 2s. 6d. and 6 pints of beer per day. From Essex I have received letters from Mr. W. Delf, of Great Bentley Hall, Colchester, and from Mr. Wm. Thompson, jun., of Thorpe, near Colchester. Mr. Delf states that he considers the system of piece work to be most equitable for both masters and men. It enables a good workman to turn his labour to the best account; and an indifferent labourer will be much improved by it, as he will be thrown upon his own resources; and in times of scarcity the advantage to the employer is great, as he will get at least one-third more work done by the same number of hands. Wheat is hoed at 3s. 6d. to 4s. 6d. per acre; peas and beans about the same; mangold and turnip hoeing, including singling, at 4s. to 5s.; mowing rye-grass and clover 2s. 6d. to 4s. 6d., with 3 pints of ale and small beer. Harvest work is let to a company of men, at the rate of £6 to £6 10s. per man, each to do from 9 to 11 acres, half wheat and half soft corn: where the occupations are small the second crop of clover is included in the corn harvest, and sometimes a few acres of turnips to hoe. This is done to enable a farmer to increase his company to what is called a carting company. Almost unlimited potatoes of beer are allowed, of various degrees of strength. The harvesting of mangel wurzel has become an important feature in farm work, from 9s. to 12s. per acre is a common price paid for this work. Mr. W. Thompson advocates piece work, and thinks day work tends to make men lazy. There are two ways of paying harvest wages in this locality, one is by the month of 24 fine working days, the other by letting the men as many acres as they can fairly do in the month, varying from 8 to 12 acres for each man; on the best farms near the coast 8 acres are enough. £6 has been the rate of harvest wages for the last three or four years. Each of his men working by the piece cut rather more than 9 acres of wheat and barley, in equal proportion, last harvest. Draining at 30 inches deep costs from 4s. to 6s. for 20 rods or poles, the furrow first being ploughed out; pul-

ling mangolds and swedes, and laying them in rows ready for filling into carts at 3s. to 3s. 6d. per acre. I have also received letters from Mr. Hawkins, of Bentley, near Ipswich, Mr. Ruston, of Chatteris, and Mr. Robert Russell, of Farningham, but they also reached me too late for me to make use of. From Scotland I have received several most interesting letters full of valuable information, and which I only regret I cannot give you at length. However, I extract from them as follows: Mr. Hope, of Fenton Barns, Drem, writes that there is much less work done by the piece than there was some years ago: except filling manure and switching hedges, everything else is done at day's wages. Draining is now almost over, and the mowing and reaping machines have put an end to cutting clover and hay by the scythe, and diminished the quantity of grain that was formerly let by the acre. Last harvest Mr. Hope cut four-fifths of his grain by machinery. The men in charge of the machines are engaged and paid by the year, but he allowed each man a small sum for every acre cut. It was gathered and tied up on day's wages; of course, the gatherers had to keep up with the machine. His work-people are mostly hired by the year, and are either married, or young men living with their parents. He has no "bondagers." The men are paid in grain, with keep of cow, cottage, &c., and may have about 13s. per week. Mr. J. Wilson, of Edington Mains, Berwickshire, states: "Our towns and villages are small and wide apart, so that there is a necessity for the labourers required for each farm to be resident upon it; and accordingly a row of cottages forms an invariable part of every homestead. The "hinds," as our farm labourers are called, are engaged by the year from Whitsunday to Whitsunday, the engagement taking place about the 1st March. A hind's wages at present consist of £4 in money, 54 bushels of oats, 21 bushels of barley, 9 bushels of peas, the keep of a cow (grass in summer, and 3 tons of turnips and straw in winter), food during harvest, say for a month, and a small money allowance when delivering grain. This will amount to about 10s. per week, taking one year with another. Being a yearly servant, his wages are not liable to deduction from bad weather or casual sickness; but with the terms already enumerated, there is associated a further arrangement, by which the hind engages to furnish throughout the year the services of a female or stout lad, popularly called a "bondager," for whose work the hind receives at the rate of 1s. per day from Candlemas to Martinmas, and 10d. from the latter to the former term, with the current rates of harvest wages, say from 2s. 6d. to 3s. while reaping is in hand, and food all harvest. On consideration of keeping this field-worker or bondager, he further gets a cottage and small garden rent free, has what coal he requires carted by his employer, and gets one-third of an acre of land on which to plant potatoes, the farmer supplying manure and horse labour, the hind providing the sets and undertaking the hoeing and digging of the crop. From the remarks in a most interesting letter I have received from Mr. Wilson, which I regret time will not allow me to read, there does not appear to be the same objection to the bondager system that many people have hitherto thought; indeed, the farm labourers of Berwickshire appear to be a most thrifty, intelligent, and well-conducted class of men. The harvest work is done by the day, the men working in sets of five for ten hours a day, any piece work upon the farm being quite the exception. Mr. Peter MacLagan, of Pumphrestone, Mid Calder, Mid Lothian, in a highly interesting letter, which it is a pity the Club cannot publish in full, states he prefers piece work to

day labour, considering it more profitable to the employer, and an encouragement to skill and industry to the workman—has always felt the great injustice of that too prevalent a system of paying the same wages to all men and women performing the same kind of work, regards such a system as a premium to idleness, and leaving skill unacknowledged and unrewarded. In Mid Lothian very little of the work is done by the piece, except hay-cutting, which costs 2s. 6d. to 3s. per acre, without beer. Potatoes are occasionally, after being dug or lifted, raised and sacked ready for market at 9d. per boll of 4 cwt. When harvest work is done by the day, the reaping is performed by a machine or by a band of reapers, overseen by a careful man, two reapers being put on a ridge of 18 feet, and one man binds to four reapers. Formerly, when tooth sickles were used, and the work was performed more slowly, one man bound to six reapers. At the present day there are certain men in every district who make a business of contracting for the cutting of the crop; they supply all the workers, and obtain lodging at the steading, with, perhaps, milk for their porridge. The price of cutting, gathering, binding, and shocking is from 8s. to 10s. per acre. One of the great advantages derived from the use of the reaping-machine is the doing away with the evil of crowding so many people of both sexes promiscuously about the steading at harvest time. Draining is always done by the piece, at a cost of 1s. 8d. to 2s. per chain of 22 yards, three feet deep, and from 2s. 6d. to 2s. 8d. for four-foot drains. The practice in Mid-Lothian of hiring the hinds is the same as in Berwickshire; but the annual payment is as follows:—65 stones of oatmeal, 12 to 16 cwt. of potatoes, and £22 in money; in East Lothian, 9 qrs. of oats, 18 bush. of barley, 24 to 32 cwt. of potatoes, 2 qrs. of beans, keep of a cow for one year or £6, lint money £1. Mr. Mac Lagan states that “bondages” are gradually being abolished, and a system of establishing female bothies is being introduced. Mr. Robert Elliott, of Leighwood, near Dunkeld, who has one of the finest homesteads in the country, with a tract of country of 15,000 to 20,000 acres in extent attached, belonging to the Duke of Athole, states in general the work of the farm in Scotland is performed by day work; piece work is, however, gradually creeping in, and is generally preferred by those who have tried it. On a small farm, occupied by a working tenant and his family, he considers the ordinary work can be most profitably done by the day; and on all farms where horse labour is employed, the work should be done by the day, while all other operations can be performed more economically by the piece. In Scotland turnips are generally cleared and singled by women and boys, with a proper superintendent sent along with them; here day work is the best. Mr. Elliott, however, thinks where men are employed as in many parts of England, piece work is by far the best. He has even let the clearing of land of boulders or earth-fast stones by the acre. Mr. Elliott has about half his corn cut by the acre at about the same price we pay in England, viz., from 8s. to 10s. per acre; the other half by the ordinary workers of the farm, on days’ wages. The wages of a hind throughout the year are 11s. 6d. per week, with a house and small garden, and the keep of a cow. He condemns the practice of paying men in meal above the requirements of their family, and strongly advocates the garden and cow; he keeps 24 cows for his ploughmen. From what I have gathered of the Scotch system, I am inclined to think that while we are before them in piece work, they are before us in England in the management of their day work; for it appears whenever a number of teams of horses or men are

sent out, or a gang of women and boys, a trustworthy man accompanies them as overlooker, whose duty it is to keep them going, and to work himself. A similar practice with gangs of boys has for many years been adopted with much success on the Duke of Bedford’s farm at Woburn. Perhaps, after having read the plans and opinions of so many other farmers, I may now be expected to state my own practice; it is as follows:—To let as much work as I possibly can, particularly to the best-conducted and those of my men who have large families. The work done in this manner, commencing after harvest, is the filling of manure, for which I pay for the heap or for emptying the yard; I consider this plan preferable to paying by the load; there is no dispute then about the size of the load. The trimming of hedges, with the bushes raked, at 2½d. per chain. The whole of my land is what is styled turnip land; but as I do not wish to grow that root so frequently, I grow a large breadth of wurzels, two-thirds of which I leave on the land to be consumed by sheep in the spring, for the getting up and covering of which I give from 7s. 6d. to 8s. per acre; the other one-third are thrown into small heaps, and covered with the tops, ready for the carts; for this I give from 5s. to 6s. per acre; the carting and clamping are done by the day. Turnips cleaned and covered, with one-fourth to go off, at from 7s. to 8s. per acre; this price includes the filling of those that are removed. Hand-hoeing wheat from 3s. to 3s. 6d.: last season used a newly-invented horse-hoe for this purpose with great success: hoeing peas after horse hoe, 2s. 6d.; beans, 3s. 6d. to 4s.; turnip and mangold hoeing on the ridge, at twenty-four inches apart, setting out and flat hoeing, 5s. 6d. to 6s. 6d. per acre; washing and shearing sheep, 8s. per score; mowing grass and clover, 2s. 6d. per acre, with beer. My plan of harvesting has hitherto been to hire the whole of my men and boys, generally at double their ordinary day’s pay, with a liberal allowance of beer for the month, thus securing their services. Besides this, however, I let to a company of these same hired men the cutting of the wheat and barley, thus giving them an opportunity of earning more than their day’s pay. I have had two reaping machines, which in certain seasons have done good service, but during the last two seasons they have been of little use. I have found this plan to answer very well; but I must confess, from all I have heard and seen, that the most satisfactory plan is, as I before stated, to let the whole of the cutting, carting, and thatching, as adopted by Mr. Pike and other gentlemen. The principal thing that will require looking to, under this system, is to see that they do not carry the corn before it is ready. And now, gentlemen, I think I am justified, by the correspondence I have read to you, in stating that a well-adjusted system of piece work, particularly in busy times, appears to be approved by the practical men who have favoured me with their views; and I take this opportunity of publicly thanking those gentlemen for so kindly and promptly forwarding me such valuable information. With the increasing demand for labour, with a decreasing supply in many parts of England, it behoves us as farmers to adopt a course by which to meet this state of things. The extension of piece work, I hold, will have this tendency. Our position differs materially from the farmers of a former generation. At the present day we have far more expensive machinery, with well fed teams, to be kept going, a greater number of much more valuable animals to be tended, larger crops to be gathered, and higher rents to pay; we cannot afford, therefore, to have fellows crawling through their day’s work as in times gone by. We must, like the manufacturers, have more activity, if we pay more

for it. Piece work appears to be desirable for the following reasons:—1st: It enables the farmer to get his work done more expeditiously, and at the proper season, with less supervision on the part of the master. 2nd: That, generally, it is less expensive than day work, and the master pays for no more than is done. 3rd: That, regulating wages by the quantity and quality of the work performed, is an incentive to industry, and affords greater scope for the exercise of skill, thereby giving the industrious and skilful man his legitimate advantage over the lazy and indifferent one. 4th: By placing higher wages within the reach of the labourer, the temptation to the best of our rural population to leave farming work for other spheres is lessened. I would here remark that I consider it essential to the system working properly for both master and man, that the price to be paid should be fixed either before the work is commenced, or, at most, after the men have had one day's trial. And here, gentlemen, although I may be travelling somewhat out of the record, I would observe, in conclusion, that I am not one to agree with those who speak harshly of the English agricultural labourer. I am often surprised—knowing, as I do, that they are in many cases used as machines—to have as much as possible taken out of them, and then turned aside; and, considering the wretched and comfortless hovels to which many of them have to return after a hard day's work, with many and severe privations, known only to those who go upon errands of mercy among them—I say it is a wonder to me that they are generally such an honest and well-conducted class of men. I have found, in the main, that those who are treated with kindness and consideration appreciate it, and evince their gratitude by taking a greater interest in their master's concerns. Many little acts of kindness may be shown to themselves and families, that will cost their employers comparatively little, while at the same time it may afford them much comfort, and convince them that you are anxious to promote their social welfare. I have lately read with much pleasure one or two articles in the *Mark Lane Express*, relative to the Sunday work of the farm. There is, no doubt, much more done than need be; a little forecast on the Saturday, and extra help on the Sunday morning for an hour or two, would prevent this. I am aware some men like an excuse for not attending a place of worship; but it behoves us as masters as far as possible so to arrange our work that the blame may not rest with us. The employment of boys on the Sunday cannot for a moment be defended. Many a man has traced his downfall to his youthful occupation of field-keeping on the Sunday. It is much better, and is carried out by many farmers, to employ men for this work—one to take the morning, and the other the afternoon. By this method they each have part of the day for public worship. The articles to which I have alluded also recommend very highly the distribution amongst our labourers of that most useful and interesting periodical, the *British Workman*. Having adopted for some years past this practice myself, I join the writers most cordially in their recommendation. I have found the distribution to be attended with a good moral effect upon my labourers and their families; and although they may not adopt total abstinence views, yet the reading of these periodicals, illustrated with such beautifully executed woodcuts, tends to check that inordinate love of drink which is the ruin of our rural population, and has fostered a desire to cultivate more provident habits. But whilst I advocate and commend a kindly feeling towards the employed, we must not forget that neither charity, philanthropy, nor other good feelings of the same class, will enable farmers to pay labourers good wages; nothing but good pro-

fits will, in the long run, enable us to do this; and good profits can only be obtained by a close adherence to the well-known maxims and laws of business.

Mr. P. H. FRERE (Cambridge) said he was sure every member of the Club would feel under deep obligation to Mr. Howard, for the great pains which he had bestowed on the preparation of his introductory paper (cheers). He had himself come there with a strong impression of the great importance of piece-work as the only practical test of the cost of labour. Never was there cheaper or more economical manual labour on the land than that which had been done in the nineteenth century by gangs of English navvies, who were paid entirely by piece-work. He might contrast their work with that which was done in Ireland during the famine a few years ago, when the ordinary rate of wages was 8d. per day, it being a question whether it should not be raised to 10d. or 12d., to enable the people employed to keep body and soul together. From what he saw of the labour performed in Ireland at that period, he was convinced that there never was a dearer labourer than the Irishman receiving 8d. a day. Until they came to test the cost by piece-work, they could not possibly tell whether labour in a particular district or neighbourhood were cheap or dear. At the time to which he referred, drainage was being introduced in Ireland, and although wages was but 8d. a day, the actual cost of drainage per acre was two or three times as great as it was in this country, where wages were from 20d. to 2s. a day (Hear, hear).

Mr. H. TRETHEWY (Silsloe, Ampthill) agreed with the preceding speaker, that they were all very much indebted to Mr. Howard for introducing the subject as he had done. The gentleman who suggested it for discussion declined to bring it forward. The committee, however, thought it so important, that they decided upon retaining it on the card, taking their chance of being enabled to induce some one to undertake it. Mr. Charles Howard having been appealed to, as a gentleman who was likely to do justice to such a topic, he responded to the invitation, and the paper which he had just read would convince anyone that the committee acted with sound discretion in placing the matter in his hands (cheers). In estimating the cost of labour, they must all feel that they had difficulties to contend with, and that the difficulties were increased by the circumstances of different customs prevailing in different counties. For example, in some districts it was customary to give the labourer a certain amount of beer or cider—a practice to which Mr. Howard adverted—in addition to money, and it was important to ascertain whether or not beer or cider was given in the generality of cases. It had been objected to piece-work, that it required more supervision than day work. For his own part, he was of a contrary opinion (Hear, hear). He thought it was much more easy to check piece-work than day-work (Hear, hear). That higher wages would almost always be earned by the former than by the latter, there could be no question. At the same time, though higher wages were paid, it did not follow that the work would be more costly to the farmer who paid them; on the contrary, he might get a given quantity of work done cheaper. It would be easy to elucidate that by example. Draining might cost 9d. or 10d. per pole, if the work were done by the day, and only 8d., if it were done by the piece. In the latter case the labourer would earn more money than in the former, and yet the work would cost the farmer less.

Mr. J. B. SPEARING (Moulsoford, Wallingford), after acknowledging the practical value of Mr. Howard's paper, said as a farmer he felt the desirableness of having as much work as possible done by piece; but, as they all knew, there was a great deal of work that could not be done in that manner

(Hear, hear.) On referring to his labour-book, he found that last year out of £800 which he paid for labour there was only £300 for piece-work. From his own observation and experience he had no hesitation in saying that the practical farmer who was a judge of his business had no difficulty in obtaining a fair day's work for a fair day's pay (Hear, hear.) The mischief was, that many men took land who did not know what was a fair day's work (Hear, hear.) Labourers soon found this out, and adapted themselves to such a state of things (laughter.) This kind of ignorance prevailed to a greater extent than many might suppose; and he was induced to think that the amount of work which farmers obtained from their labourers was generally pretty much in proportion to the knowledge they possessed of their own business.

Mr. COLEMAN (Park Farm, Woburn), did not agree with some of Mr. Howard's correspondents, that there were many kinds of labour on the farm that could not advantageously be done by piece-work. There were, in his opinion, only one or two things which it was not desirable to have done in that manner; one was the forking of twitch, the other ploughing by horses. Mr. Howard said, and he thought every one present would agree with him, that it was not only beneficial to the master, but also far better for the men, that labour should be done by the piece. Why, then, was it not done in that mode always? One reason was, that on small occupations, employing only five or six men—and there were a great number of farms that did not employ more—it was almost impossible to adopt that system. It would take more time than the farmer had at his disposal to look at the work which each man had done. Nothing would tend more to the substitution of piece for day work than a deficiency in the supply of labour (Hear, hear.) He (Mr. Coleman) had changed his occupation two or three times during a short career, and on each occasion had drawn men from day-work to piece-work. Labourers were generally reluctant to make the exchange; but if employers would not be too particular, if they would not grudge a shilling or two at first, the object would soon be accomplished (Hear, hear.) If the farmer who adopted piece-work put out his work in such a manner that the labourer could not earn more than an ordinary day's wages, it was no use attempting such a change of system (Hear, hear.) There must be liberality of payment on the part of the employer, and then there would be liberality of work on the part of the employed. On a bright May morning two or three years ago he went to a part of his farm where there were two men who did not know whether they were to work for him by the piece or by the day. On arriving, he found them both very leisurely at work with their coats on. He offered them piece-work, and they accepted the offer. They then set to work in earnest (laughter.) He sat on his horse watching them for about half-an-hour, and at the end of that time the oldest of them said, "Master, if you don't go I must pull my coat off." He would advise all farmers who could to adopt piece-work. Piece-work was objected to because it gave the farmer more trouble than day-work. On that point he would remark, that the men did not give so much trouble, but the quality of the work gave more.

Mr. J. THOMAS (Bletsoe, Beds) was glad that this very important subject had come under discussion in the Club. Having been a farmer for some years, he held that piece work was decidedly preferable to day work. When he first entered on his present occupation, he found that the men employed on the farm had been indulged more than the generality of labourers were; and therefore, for a time, he gave them rather more latitude than he otherwise should have done. For example, they were allowed an hour for breakfast; and as

some of them had to walk to it from one end to the other of a farm, the farm consisting of about a thousand acres, the hour frequently became nearly two hours. After a time, he remarked to his foreman that he could not stand this; that he would pay good wages, but must have his work done by the piece. The men, on being told this, replied that they were not accustomed to work by piece, and did not like it. The reply was that, if they did not work by piece, others must be found, who would. The men soon got into the new system; and, instead of its now involving more difficulty as regarded supervision, it involved less (Hear, hear.) Of course, his foreman had to see what work was done; but the difficulty of keeping men at work, that attended day work, was avoided. He now got all the work he could do by piece, and that enabled him to get his work forward (Hear, hear.) The first time that he used a reaping machine, several of his men struck. They said they would not tie after the machine. "Very well," he said, "then you must go and reap." He set them to reap at a price agreed upon, and the result was, that they found that they could have done better at the work which they had deserted.

Mr. J. BRADSHAW (Knole, Guildford) thought that practical subjects like this could hardly be too frequently presented for consideration, especially as the improvements which were constantly taking place in agriculture had an important bearing upon them. He was a novice in the cultivation of land by steam; but he had commenced; and, having paid very great attention to the matter during the last month, he saw clearly the advantage to be derived from paying those who were employed by the piece. He had no hesitation in saying that it made a difference of two acres a day in the progress of the work. Speaking generally, he was a strong advocate for piece work on the farm. In his own neighbourhood he had seen the benefits of that system strikingly illustrated. When he entered upon his occupation, fourteen years ago, the general rate of wages in the parish was 9s. a week. What was it at present? There was nothing less than 11s., and he himself paid 12s. Last year the able-bodied labourers on his farm earned 13s. 6d. a week. One result of such an improvement was the rearing of a superior class of labourers—a class of men who were not seen in his district fifteen years ago. One of our great contractors, in speaking to him about Surrey labourers, said that, if they were put into a gang of regular navvies, they would not live ten days. Piece work tended to alter that state of things, by improving their physical condition. He was convinced that, if labourers were well treated and well paid by their employers, these would be rewarded by their conduct, and also obtain a good money return (Hear, hear.).

Mr. THOMAS begged to say one word in explanation. He had stated that at starting he had great difficulty in getting his men to work by the piece. So far from that being the case now, after they had had experience of piece-work and derived benefit from it, if they did their work badly, in order to punish them he made them do day-work. It was extraordinary the effect which working by piece had produced. Men on his farm who formerly earned 10s. a-week now frequently got 15s. or 16s. in the same number of hours at piece work.

Mr. JAMES HOWARD (Britannia Works, Bedford), having risen in consequence of repeated calls, said, that in farming, as well as manufacturing, no matter whether the men worked by the day or by the piece, the more practical knowledge an employer had of his business, the more work would he be likely to get for his money. Having had some little experience both in farming and of manufacturing, he was sure

he might safely affirm that any man might get one-third more work done by the piece than by the day. He would add that some of the most valuable improvements in manufacturing had sprung from the suggestions of men employed by the piece, who were anxious to facilitate the operations in which they were engaged. (Hear, hear.) He quite agreed with one or two previous speakers that rather more trouble of a certain kind was involved in letting work by the piece than in letting it by the day. But this was only in the inauguration of the system; when it became general, piece-work was attended with less trouble to the employer than day-work. He could easily understand a master's shirking the trouble of having, every now and then, to set labourers to work on a fresh job, and regulate the price of the work each time, especially in districts where piece-work was not the rule. But after a time the difficulty would be removed by practice. His experience with regard to labourers was that they were not half so good judges as to what amount could be done as masters. He had himself paid 25 per cent. more for work than it was worth at the commencement; but, like Mr. Coleman, he had found that there was a sliding-scale which almost always slid in the right direction. (Laughter.) Some men objected to piece-work on the ground that they could not get their work well done by that means. The result of his own experience, extending over some years with some hundreds of men, was that there was less trouble in getting work done well by the piece than in getting it done by the day. (Hear, hear.) He had generally found that where men worked by the day there was often an indolence and indifference which it was difficult to overcome; while, on the other hand, the energies and intelligence of the labourer were called out by piece-work, and if the work were not done properly the employer could refuse to pay. Living in an agricultural district, he could warrant for the fact that a great many of the best agricultural labourers leave farming operations for more profitable spheres of labour; and if, through a more general adoption of the system of piece-work and a more general employment of expensive machinery, such persons could obtain more remunerative employment, the temptation to leave the work of the farm would be removed. (Hear, hear.) Some object to piece-work on the ground that when labourers have once been accustomed to task work, earning good wages, they make but indifferent day-work men. He must say that this corresponded very much with his own experience. There was one point which must not be overlooked. A great deal had been said about the labourers being enabled to earn more money by piece-work. But it should be remembered that that extra money did not all go into the labourer's pocket. If a man did twice or one-third more work than he did previously, it cost more to maintain him (Hear, hear), and although the farmer might be benefited by having the work of ten men done by eight, the additional earnings were not all clear profit to those employed. Having now had considerable experience both of day and of piece-work, he had come to the conclusion that wherever it was practicable it was best for both master and men that the work should be done by piece.

Mr. S. SIDNEY (Kensington) said, that without the direct appeal of the chairman, he should not have addressed the Club on a subject so eminently practical, and which has, as regarded the comparative value of day and piece-work, been exhausted in Mr. Howard's able paper. That paper, and all that he had heard from the speakers who followed, confirmed the impressions he had gathered in recent visits to four counties—differing very much in character, but all very low in the social scale, as shown in the condition of their labourers

twenty years ago. He found by the evidence on which he could rely, that in Kent, in Wiltshire, in Gloucestershire, and in Bedfordshire the agricultural labourers had improved and were improving in their social condition and their moral character, and this improvement was of the greatest possible importance to the employers of labour. There were influences and attractions constantly at work in these railroad days, drawing the agricultural labourer to the town, the factory, and the railway. The good implements, the steam machinery, now daily coming into more common use, required good men to work them, and good men could only be retained in agricultural employment, by affording wages and comforts which would satisfy good men. Pace was the distinguishing character of modern agricultural operations, and pace required intelligence. When oxen drew the plough, ploughmen crawled at the ox's pace. Good pairs of horses made them move quicker, and steam cultivation quicker still. At the great meeting in Edinburgh, on the question of labour, an opinion was expressed that Scotch labourers had deteriorated—certainly not improved. If that were so, it must be because the condition of the Scotch labourer had not kept pace with the temptations offered by cheap conveyance and high wages elsewhere. He (Mr. Sidney) believed that the English labourers' condition and quality had both been decidedly improved, and must continue to be improved, if the farmers meant to thrive. Good food and good cottages, which meant good wages, could alone retain and maintain labourers fit to carry out the best modern system of cultivation. Mr. Frere had expressed a hope that all Mr. Howard's correspondence would be published. He (Mr. Sidney) begged to inform him that it was not the habit of the Central Farmers' Club to bury valuable information, or even to defer its publication until it was quite stale. Their discussions were open to the press, and published in full in the Club's transactions; and it might be interesting to the Royal Agricultural Society's Council to know that the Club had flourished in proportion as its transactions had been made public.

The CHAIRMAN said: Before Mr. Howard replied to any of the remarks arising out of his excellent paper, he wished to mention one little practical point: it was, that when papers were submitted which would be published and circulated among large numbers of occupiers of the soil, it was desirable that if a particular practice or system were advocated in them it should be stated what quality of soil was referred to. (Hear, hear.) In Mr. Howard's introduction, for example, allusion was made to Mr. Pike's practice of cutting his stubbles very close; whereas he (the Chairman) had no hesitation in saying that in some soils and some districts it was more beneficial not to cut stubbles very close. He knew from his own experience and the experience of others that on some soils, where stubble was grown to a large bulk, and, bearing in mind, 6 to 8 inches just above the ground, the quality for fodder was so very inferior, that it was better management to plough it in than incur the expense of carting it off. When, therefore, a particular system or practice was mentioned, the character of the soil should also be mentioned. He agreed with others who had spoken, that there was a great improvement in the treatment of the labouring population, and he hoped the improvement would continue.

Mr. HOWARD then replied. There was very little for him to say, as most of the speakers agreed with what he had advanced. With respect to a remark of Mr. Coleman's, he contended that there was much less supervision required for piece-work than for day-work. When there was a proper understanding between masters and men, and when the former were determined that their work should be done properly, and the

latter knew that such was the case, there would be little trouble involved in securing good piece-work. Adverting to the remarks of the Chairman with regard to Mr. Pike's stubble, he said he was aware "the chair could not err;" but he would excuse him when he said that he had offered no opinion upon the matter, in fact it was not on the card as the subject for discussion; but from the worthy Chairman's remarks one would suppose that he was one of those good old sportsmen we sometimes hear of, who did not like stubbles to be cut, lest their sport should be spoilt. (Laughter).

Mr. W. F. HOBBS moved a vote of thanks to Mr. Howard for his able and valuable paper. That gentleman had touched on almost every point connected with the relative merits of piece-work and day-work. He quite agreed with him and others who had spoken, that the subject was one of great importance, and that there was a difference of 20 or 25 per cent. in point of economy on the side of piece-work. Twenty years ago piece-work was the rule and day-work the exception. Now, the case was the reverse. The farmers of England had themselves to blame for this. They were not united, as the labourers were united, through the medium of the beershops; there was, in many cases, great jealousy among them with regard to the work done; and he was sorry to be obliged to agree with one or two preceding speakers that many masters and bailiffs had not that practical knowledge of the value of piece-work that their predecessors possessed. Under these circumstances he thought the committee had done their duty by arranging for the subject to be discussed; and he hoped the matter would not stop there, but that the question of the comparative merits of day-work and piece-work would be taken up by farmers generally. He was sure they would all concur with him that Mr. Howard was well entitled to the acknowledgment which he had proposed (cheers).

Mr. H. TRETHEWY seconded the motion, which was carried unanimously.

On the motion of Mr. MARSH, seconded by Mr. JAMES HOWARD, thanks were voted to the chairman, and this terminated the proceedings.

THE LATE MR ROBERT BAKER, OF WRITTLE.

—At the committee meeting of the Central Farmers' Club, on Monday, March 4, it was resolved, on the motion of Mr. Trethewy, that a portrait of the late Mr. Robert Baker, of Writtle, as "the Father of the Club," be painted, and placed in the Club rooms: and further, that the expense of this be defrayed by private subscription amongst the members, not to exceed ten shillings each. A number of gentlemen at once put down their names, while subscriptions are still being received by Mr. Corbet, the secretary.

PRESENTATION TO MR. R. DOIG, OF TY-NEWYDD.

—The retirement of this gentleman from the management of the Hon. Col. Pennant's farms, an appointment which he has held for the last eleven years, was deemed by his friends and admirers a fitting opportunity to present him with a substantial testimonial, not merely of affectionate regard for his private worth and social qualities, but in recognition of the eminent services he has rendered to agriculture in general, and to Welsh agriculture in particular, by improving the breed of Welsh cattle, which, under his fostering care, have been brought to a state of perfection rivalling even the short-horn breed itself. The number and character of the prizes won at the great national, metropolitan, and provincial shows by Penrhyn stock, sufficiently testifies the judgment and care exercised by Mr. Doig in discharging the duties entrusted to

him by the Hon. Col. Pennant—duties of a most onerous character, and demanding agricultural knowledge and skill of the very highest quality. The testimonial presented to Mr. Doig consists of a large and handsome epergne (convertible also into a candelabrum, with six lights), which, with the plateau, is nearly three feet in height. It is richly chased, and ornamented with laurel foliage and the Scotch thistle, executed in frosted silver. The base is triangular, one of the sides being occupied with Mr. Doig's arms, the second containing portraits of the Welsh ox, which carried off the prize at Smithfield, and the mountain ram, which took the Royal Agricultural Society's Prize at Chester. The other panel contained an appropriate inscription. The plate was supplied by Mr. Dismore of Liverpool, at a cost of about 130 guineas. The presentation took place on Wednesday, March 6, at the British Hotel, Bangor, an elegant collation being served up on the occasion, at which R. M. Griffith, Esq., presided; the duties of the vice-chair were ably discharged by Mr. Drew, who acted as honorary secretary to the committee.—*Chester Courant*.

BATH AND WEST OF ENGLAND SOCIETY.

A meeting of the council of the Bath and West of England Society was held at Waghorn's Railway Hotel, Taunton, on Saturday, March 2nd, R. K. M. King, Esq., in the chair. There were also present, Messrs. C. Bush, G. S. Poole, R. N. Grenville, J. Bailward, J. Lush, J. W. Walrond, S. Pitman, R. May, J. Hole, J. D. Hancock, H. G. Moysey, W. E. Gillett, F. H. Dickinson, E. S. Drewe, Thomas Hussey, John Fry, Wm. Porter, John Widdicombe, Thomas Newman, C. Gordon, junr., John Gray, Jonathan Gray, Wm. Thompson, J. H. Cotterill.

THE TRURO EXHIBITION.—A communication from the Cornwall Horticultural Society was read requesting the use of certain tents for holding its exhibition in the yard of this Society, at Truro, in June next. The application was granted; the arrangements to be made under the superintendents of Shedding. A note was read from the mayor of Truro, offering to place the several rooms of the Guildhall at the service of the Society on the occasion of the forthcoming exhibition. The secretary was requested to acknowledge the receipt of the same, thanking the mayor for his courtesy, and stating that the council would not require the rooms. Another letter from Truro was also read having reference to a proposed exhibition of pictures and portraits, having special reference to the notable characters of the West of England, and asking whether such an exhibition would be considered detrimental to the interests of the Society. The secretary was requested to acknowledge the receipt of the communication, and to state that the council saw no objection to such an exhibition. There was a proposal from the Royal Cornwall Agricultural Society, offering a special prize of a silver cup, value not less than £40, to be held by competitors only after they have been successful candidates for two successive years, for colts or fillies in class 46 of the Society's prize sheet. The council acceded to the proposition.

THE LIBRARY.—A report of the Library Committee was read, recommending the care of the books to be placed either with the Literary and Scientific Society of Bath, or with the Institution in Taunton. The council considered that both places were equally advantageous; but as the Society was originally established at Bath, they decided in favour of that place.

NEW MEMBERS.—The following gentlemen were elected as new members:—Mr. William Trethewy, Grampond, Cornwall; and Mr. John Ford, junr., Rushton, Blandford.

HUNGERFORD FARMERS' CLUB.

The following letter was read by Mr. Franklin at one of the late meetings of the Hungerford Farmers' Club, and for which a vote of thanks was recorded to Mr. Coleman:—

THE WOBURN SYSTEM OF FATTENING CATTLE.

Woburn Park Farm, Jan. 10th, 1861.

MY DEAR SIR,—I will now try to answer your questions from what of the subject has come under my own notice, and not from what has been said or written by others. First—"Can cattle be stall-fed to advantage by the occupiers of arable land?"

Yes. Where the soil is of a clayey or tenacious texture the fattening of cattle is not only profitable, but absolutely necessary, as I am well assured there is no means of keeping up and increasing the fertility of a farm so advantageous as the feeding of stock. I look upon cattle as manure manufacturers that do not dip into our pockets quite so deep, nor disappoint us in the quality of the article left behind, so much as many of those who now frequent our markets, and bother us to purchase the *very best* manure that was ever offered to the public.

Where the soil is light—of gravel, chalk, or sandy nature—such as requires treading with sheep, many of our best farmers keep no more cattle than are absolutely necessary to convert the straw into manure, as they can spare but few if any roots off the land, and sheep-feeding saves carting turnips to the homestead; and, in consequence of the remunerative prices of mutton and wool, it is not advisable to try to produce beef in lieu of them, where soil, climate, and situation are adapted to sheep farming. But, as I rather opine, that is not the case with many of your friends who occupy land, that, while producing good roots, sticks to their own feet, and hangs to the sheep too much to allow them to get about with comfort to themselves or profit to their owners. To the occupiers of such soils it is of vital importance that the feeding of cattle should leave sufficient profit to repay the trouble, and not (as in some instances that have come under my notice) "kick down" what little the other departments of the farm may have realized.

I do not consider, as many do, the value of the manure to be quite ample to compensate the feeder for roots, hay, and straw consumed, or time and attention expended; but I want cattle to pay something more than the cost of the corn or cake consumed by them. But let no man think of buying cattle to feed at a profit if he does not know a good one from the wretches that are exhibited for sale at many of our fairs and markets, and which when purchased, "big for money," only disgust the feeder at the slow progress they make. I would therefore counsel your friends to *look more to quality*, and remember that one of the greatest secrets in profitable stall-feeding cattle is to have the right sort of animal to begin with. I do not hold with those who purchase big old oxen for putting in the yards or boxes, but have found those the most profitable that will grow and feed at the same time, taking care not to purchase too young, as one extreme is as bad as the other. I have invariably remarked that it is not the man who gives the highest price for store cattle at fairs or markets who gets the best paid, but who, with an eye to quality, never goes far into the "teens."

The description of animal best adapted for stall-feeding is, I consider, "a well-bred Shorthorn," such as are bred and

kept in Lincolnshire, in the neighbourhood of Lincoln, Horn-castle, Grantham, Causton, and other places, as they are *more fleshy* animals than the Yorkshire Shorthorn, at least than such as find their way from those districts into the midland and eastern counties fairs and markets; but with the present facilities for travelling, let a farmer go into the districts where cattle are bred, and select for himself, and he will find ample recompence for the trouble occasioned; and not be ready to purchase any brutes that may be offered to him at home, just to save himself the trouble of going where good ones are to be found. I may here mention that having resided nearly all my life in that stall-feeding county, Norfolk, where the rents of very many farms are paid by the cattle they fatten, and being acquainted with nearly all the best managers of stock in the county, I have had a little opportunity of judging of the merits of the system there pursued; for the last seven years I have fed from 100 to 200 head of cattle every Winter.

The Hereford is undeniably one of the most rent-paying of animals for Summer grazing; but I have not yet found him quite come up to the Shorthorn for stall-feeding purposes, unless you get some of the very best bred ones, and as the Shorthorn is easiest to procure, I would advise your friends to stick to them.

The Devons are great favourites with many farmers in consequence of the rather superior quality, and from being, when well fatted, much sought after by the metropolitan butchers, but they do not make so much weight with a given quantity of food as Shorthorns.

"The kind of food, quantity, and method of preparing it?"

Upon this quest on there is, I am aware, great diversity of opinion, some advocating the giving an animal an unlimited supply of roots and hay; but who, I would ask, this season, is in a position to do this; others give cake or corn *ad libitum*, with what roots the animal likes to take. Now, I am of opinion both these systems are faulty, and that the great art in fattening profitably is so to apportion the various descriptions of food that the animal may be able to extract the greatest amount of fat and flesh-forming properties from them and not feed stock for the sake only of manure, as many do.

My practice is as follows: The cake or meal is ground as fine as possible, then boiled or steamed (the apparatus used being erected by Stanley, of Peterborough) for about two hours, at the rate of about 2lbs. of meal to 1 gallon of water; this will vary according to the quantity allowed per head for each animal. I have three large cisterns, about 10 ft. long, 3 ft. wide, and 3½ ft. deep, made with brick and cement, so as to allow none of the moisture to escape; into these I place a layer of hay, or straw of mixed chaff, about 6 in. in thickness, and then, upon the chaff, a layer of cut or mixed roots, in proportion 1 to 3 of chaff, or thereabouts; upon these roots the boiling cake or meal is then poured, and being then slightly stirred, to be followed by chaff and roots as before, until the cistern is quite full. The quantity of the mucilage used is about 1 gallon to a bushel of chaff. The mass is then left 24 hours, during which time fermentation takes place, and the roots are quite cooked. Care should be taken to tread down the chaff as it is put in, as the closer it is packed the better I have found it to ferment. It is astonishing the avidity with which cattle, after the first few days, will devour this mixture, and it matters not how bad the hay, if free

from grit (of course the better the hay used the more will be the progress of the stock make); and as I know that in the past season but very few farmers have gathered up their hay all well, this system offers a good chance of making the most of that which is not very sweet. I rarely if ever exceed 8lbs. of cake or meal per head *per diem*, and usually commence with 4lbs., gradually increasing as the cattle improve in condition; and as I had last Christmas 20 Hereford oxen that made £30 each, having cost £16 per head last March, not having been on very good grass all the summer, I am quite satisfied they left some profit, besides the manure, behind them.

I generally try to procure either linseed or cake to mix with barley meal, lentils, or Indian corn, using a moiety of each, finding it makes a better mucilage than either all corn or cake.

When cattle are first put in the stalls, the chaff used consists of two parts of straw and one of very inferior hay; this being reversed as they improve in condition; but it matters not how good the animals, I *always* use a portion of straw.

I have at the present time 70 head of cattle fattening and 80 as stores that are being fed upon this system. The cattle fattening have 2lb. of linseed meal to 4lb. of barley and lentils; the stores get 1lb. of linseed meal and 1lb. of inferior barley meal. Fattening cattle, 1 bushel of turnips *per diem*; stores, $\frac{1}{2}$ bushel; fattening ones, 2 of hay to 1 of straw; stores, 3 of straw to 1 of hay. I can justly say that I never see a particle wasted, but the mangers are licked out most scrupulously clean.

Too much care cannot be taken to have the roots scrupulously free from all soil, which has a tendency to scour the cattle, and also makes the food unpalatable.

I will sum up these remarks, which I am sure have already exceeded the limits of a letter, by saying, with the exercise of proper judgment in the selection of the stock, a watchful eye over them when in the stalls, and a *moderate* use of artificial food, cattle will, in my opinion, pay for stall-feeding.

Should any of your friends wish for further information from me on the subject, or think proper to pay me a visit, they will meet with as hearty a welcome as one knows how to give, who from a boy has endeavoured to learn what a good animal is, and how to make the best use of him.

I am, my dear sir, yours very truly,

JOHN COLEMAN.

The above letter was accompanied by the following note:

January 11th, 1861.

My dear Sir,—I send you a few remarks on the fattening of cattle, and you can make use of them, if you think them of any service to you.

I shall be glad to hear what your friends think upon the subject, and how they go to work in your neighbourhood to make their stock pay this year; with cake, corn, and hay so dear, and roots so very scarce, I imagine beef must be very dear before the grass comes. Excuse the hurried manner in which this has been indited, as I have other things requiring my attention.

Yours truly,

To Mr. W. Franklin, Hungerford, Berks. J. COLEMAN.

OUR OLD AUTHORS ON SHEEP-ROT.

Although farmers are proverbially a practical portion of the community, yet they are by no means wanting in the theory of their profession. Indeed, there is, perhaps, no class more prone than they are to theorise on the various phenomena of their occupation, for the best of reasons—because no other employment furnishes so fruitful a field for the purpose. They may not always be philosophically correct in their expressions; but if they err in this respect, their meaning, generally speaking, involves an exposition of the facts of the case as they are exemplified in the field and homestead, so that one requires to have experimentally a professional knowledge of their subject to understand them, as well as a knowledge of the progress science has made on whatever topic is under discussion.

Before commencing a criticism on what old authors have written on sheep-rot, it was necessary to make some such premises as the above, to prevent the reader hastily arriving at premature conclusions, relative to the exposition of fact advanced by farmers of “the good-olden times,” in reference to the dreadful malady so many of the present day experience amongst their flocks. Many of the writers, whose works we shall have occasion in substance to quote, were men of highly philosophical minds—men who occupied a very prominent place both in science and practice at the time—so that, as the question at issue is one of experimental philosophy, their writings are to be received as a faithful exposition of fact; but which must now be read in the light of the science of their day, and not in that of ours. It is only by doing so that we can hope satisfactorily to distinguish between what is thus an exposition of fact, and what may be an erroneous conclusion deduced therefrom, owing to the imperfect scientific knowledge which then existed on the subject.

On the contrary, it will be equally prudent to premise that, although medical chemistry has recently made considerable progress—enough to enable us to see many of the shortcomings of old authors, and even things generally in a clearer light—yet it must be confessed we are still far behind on this branch of science. And as progress here is matter of discovery, many discoveries have yet to be made before we can hope to give a trustworthy exposition, medically and chemically, of the details of our subject. The doings of yesterday we may read in the light of to-day as we best can; but those of to-morrow must still be left for judgment at the bar of experience, in the hope that further progress will be attained.

In a large work, “*COMPLEAT BODY OF AGRICULTURE*,” published about a century back, we read thus: “This disorder (rot) is contagious like the murrain. Wherever it appears it usually spreads through the whole of the flock, and often over the whole of the neighbouring country. Preservation from it is a point of as much importance as its cure—indeed, of more, because the cure is very uncertain.

“The causes of the rot are various, but the principal is carelessness in the owner. Sheep that feed at large upon commons are much more subject to it than such as have shelter, and are taken on and off at nights; those which feed on the dampest grounds are most subject to this, as to other diseases, and it frequently arises from a cold season and dribbling rains coming on soon after the shearing. These taint the skin and bring on the disorder. Lastly, want of food will occasion the same disease, and the eating such grass as is full of unwholesome plants. These we shall particularize in a succeeding chapter; such are the causes of this terrible disorder in its original appearance in many places, but the farmer,

besides these, is to observe that the worst and most common is infection."

"The unwholesome plants" referred to above, are whit-rot, sun-dew, and louse-wort.

"*Whit-rot*.—This is a little obscure plant, which often grows in great abundance where it is little minded, and is the cause of very terrible mischief to the farmer. It is very common in marshy grounds, where it runs close to the bottom, and is hid among the grass. The sheep find it, though their owner does not perceive it, and they eat of it abundantly among the grass, being pleased with its sharp tush. The consequence is their falling into that terrible distemper the rot, from which few that have swallowed any large quantity of this herb escape."

"*Sun dew*.—This is another of those plants which are fatal to sheep, and which are in the same manner, as often overlooked by those who know its bad effects, by reason of its smallness; but in this they are the less to be excused, because, though a very little plant, its singularity renders it very conspicuous. It is but about six inches high, but it strikes the eye at first by being all over of a red colour, and upon a closer examination it surprises yet more by being covered with large drops of water in the most violent heats; it hence obtained the English name sun-dew, and it is also called frequently '*rosa-solis*.' This plant grows, like the former, on boggy ground, and it has, like that, a sharp taste, for which the sheep like it. They eat it too frequently, and its effects are the same as those of the former: it brings on the rot, and those which have eaten much are incurable."

"*Lousewort*.—This is another inhabitant of the wet and marshy grounds, which is hurtful to sheep in a terrible manner, though not so fatal as the others. It is a much larger plant than either of those, and easier seen; but it is as often overlooked and disregarded. All our wet meadows abound with this plant. Its juicy substance and taste allure the sheep to eat of it, in those places especially where there is but little grass, which is too common a case where this plant is abundant; and it throws them into many disorders. There is no herb that has so speedy, evident, and certain an effect in fouling the blood. The most healthy and clean flock will in a fortnight grow scabby and scurfy upon the skin, their wool will be loose, and they will be overrun with vermin."

Per contra, we read from the same work, relative to the prevention and cure of this disease—"It has been observed universally that sheep fed on salt-marshes never have the rot. This put it, naturally, into people's thoughts to try salt as a cure; and we read wonders of its effects. This also I have seen tried, and sometimes with good consequences, but never with the great success that is boasted by many. Salt is a preservative against the rot, and that is all we rationally learn from the cattle not being infected with it that feed in the salt-marshes; but it is not so certain a cure. The best kind of salt for this purpose is bay-salt; and the best way of giving it is by beating it to powder, and then sprinkling it among the dry food. Though we do not advise the farmer to rely upon it entirely, we shall recommend it, among other remedies, in this manner: Bruise to powder an ounce of grains of paradise and four ounces of juniper-berries, dried; add to these two pounds of bay-salt and half-a-pound of loaf-sugar, grind them all well together, and sprinkle some of this upon the hay and the oats that are given the sheep." Should this not prove effective, the authors propose adding antimony in ale, "roots of the common avens" and "root of masterwort."

The large work from which we quote the above was printed, it tells us, "by the king's authority, in weekly numbers" and there cannot be a doubt but the authors give a faithful

account of what was said about the rot at the time it was written. Our next quotation is from the fifth edition of "The Complete Farmer, or Dictionary of Agriculture," 2 vols., quarto: 1807. This article, we may observe, is acknowledged by the writers to be chiefly from the report of Dr. Harrison, Lincolnshire, on the subject.

"*Rot*.—In farriery, a disease incident to sheep and other animals, in which both the liver and lungs are affected, and there is often a dropsical tendency. It is most connected with moisture or moist situations, but its causes are far from being perfectly investigated." After quoting Dr. Harrison's account of the appearance of the disease in different cases, his summary of the causes are given thus:—"In respect to the causes of the disease, he (Dr. H.) says it has been imputed—1st, To vitiated dew. 2nd, To a crust which adheres to the grass after wet weather, or the overflowing of running water. 3rd, To the luxuriant and quick growth of plants in hot moist seasons. 4th, To grazing certain herbs. 5th, To faciolæ hepaticæ or their ova being introduced into the stomachs by feeding in swampy and low grounds in moist weather. 6th, It has been called the sheep-pox by Professor Vibourg, of the Veterinary College at Copenhagen; but this is not properly a cause of the rot. 7th, It is ascribed by Daubenton to poor diet and drinking too much water. These different causes are objected to, and shown not to be well founded by the writer (Dr. H.), who thinks that, 8th, It seems to be occasioned by poisonous effluvia, which, under certain circumstances, are emitted from marshy soils."

In proof of this last miasmatic cause, several examples are quoted from Dr. Harrison's work, the following three being the chief:—1st. In driving a flock of sheep at Barling, Lincolnshire, one accidentally broke its leg. While attending to this animal, the shepherd left the remainder to graze in the road and ditch bottoms, when, in less than an hour, they were affected with rot, the one whose leg was broken only escaping the malady. 2nd. A Lincolnshire farmer, in sending some sheep to turnips in Notts, allowed one division of forty to stop a night at the above unhealthy grounds, when they were affected with the rot, the other divisions that did not stop escaping the disease. 3rd. As a flock of sheep were passing through a long lane in the parish of Irby, one of them, from over fatigue, dropped on the road. The others were permitted to graze until the tired sheep was able to travel. On arriving at their destination, it was found that the tired sheep only was free from rot, all the others being infected. From these and other causes, Dr. Harrison thinks himself justified in ascribing the rot in sheep and other animals (for "pigs, cows, asses, horses, poultry, hares, and rabbits become rotten in this lordship, and have flukes in their livers") to *paludal effluvia*, but at the same time he acknowledges himself unable to give a satisfactory rationale of the *modus operandi*. *Per contra*, we read from the same work: "It is confidently asserted, that decoctions of bitter herbs, with salt, have perfectly preserved sheep from the rot."

Another favourite mode of preservation, is to remove the flock from low, marshy, or wet grounds to dry quarters during night, and not return them to grazing until the dew is off, the next morning. We give the following often-quoted story verbatim. "A shepherd, who when young was shepherd's boy to an old man who lived at Netlam, near Lincoln—a place famous for the rot—told Mr. Neve, that he was persuaded sheep took the rot only of a morning, before the dew was well off. At that time they folded them in open field; his master's shepherd kept his flock in fold always till the dew was gone; and, with no other attention his sheep were kept sound, when all the neighbours lost their flocks."

Again: "Some suppose that most dependence in the cure of this disease is to be placed upon the removal of the sheep into dry situations, keeping them warm and sheltered, and giving them dry food in the yard." By keeping sheep thus under cover every night on dry chopped hay, corn, &c., the disease was prevented in Bohemia, "in the wet and fatal year 1769;" and similar cases are quoted in this country in favour of this plan.

Our next quotation is from Young's writings: "In Dauphiné, feeding in the dew is found to rot sheep more than anything, on which account they do not let them out of fold till the sun has exhaled it. Salt is the preventive; 3 lbs. to forty sheep."—*Young's Travels* vol i, p. 427.

The last old work we shall quote is "Lawrence's New Farmers' Calendar" (fifth edition): "The rot in sheep is, or rather is occasioned by a dropsy *qui generis*, common to sheep and rabbits, and, I believe, to deer. I have had young rabbits affected with it, when the lymph and water have distilled from their mouths and noses; and on dissection, I have found it filling up the entrails, and even extravasated in the chest and belly; the liver also full of flukes, as in sheep. Sheep, it is well known, acquire this fatal disease from superabundant moisture of food or wet lodging, from perspiration obstructed by cold, from distress and low keep, and various other causes. Sheep are a species which require dry countries, dry lodging, and food, if succulent, rather of a warm and spiritous, than a cold and watery nature. They are not the stock for clayey or unsound soils. An incipient rot may be stopped, and the sheep restored, by being taken up to dry lodging, and drying absorbent keep; but the disease confirmed is obviously incurable. Sainfoin, burnet, or lucern hay, straw, green

broom, pine tops, juniper, wormwood, the mints, thyme, sage, rue, carduus, with ground malt, peas, or oats and bran, or chaff, in which may be mixed hay; or common salt, willow or oak bark, according to symptoms, the animals' scouring, or otherwise, are the remedies." "Turnips," adds the same author, "from their watery nature, are our worst winter food for sheep."

Such is what some of our best authorities of the olden time tell us about rot in sheep. The views which were expressed fifty and a hundred years ago, it will be perceived, are those of the present day amongst the great bulk of farmers, both as regards the cause of the disease, its prevention, and its cure. Having recently had occasion to visit a large portion of the two divisions of the United Kingdom, we found this conclusion verified in the opinions expressed both by farmers and butchers. It was interesting to us to witness how faithfully the old traditionary account had been handed down to the present generation. At the middle of the last and commencement of the present century, the causes assigned for rot were considered unsatisfactory. Nevertheless, those causes involved matter of fact which could not be denied; and just so do we find things at the present day. The same causes are assigned, because the same matters of fact exist; but they are not considered satisfactory. We have our healthy salt marshes, our salt and other condiments, mixed with dry food, as preventives. So had our forefathers; but it requires no great amount of common sense, now any more than it did then, to perceive in all this much that will not bear criticism by practical men, when brought to the bar of Experience, as we shall show in another article. W. B.

ON THE BEST PERIOD OF THE ROTATION, AND THE BEST TIME OF YEAR, FOR APPLYING THE MANURE OF THE FARM.

BY EDWARD WORTLEY, RIDLINGTON.

With so many different systems of farming as are not only seen, but required, it would be a difficult task to point out, in one brief rule, "the best period of the rotation" at which to apply the manure of the farm. It may therefore, perhaps, be pardoned, if I at once briefly describe my own practice relating to the application of manures, and some reasons for adopting it.

The occupation to be referred to in this paper consists of 430 acres, 200 acres arable, and farmed throughout, though varying from heavy clay to what is commonly called good turnip land, on the five-field system—viz., 1st year, roots; 2nd, barley, oats, or wheat; 3rd, seeds (once mown, generally); 4th, oats or beans; 5th, wheat. I have found on both descriptions of land, that this is a far more successful rotation than the four-field system. It allows the turnips and clovers to be repeated at longer intervals. Swedes, by being alternated with other roots, can be thrown ten or fifteen years apart. It gives a stock-breeding farmer the valuable use of his seeds in the winter months—until Christmas on heavy land, and till March on light land; and it gives a much greater probability of securing a full and healthy crop of wheat than when that crop is taken after clover-brush. For many years I have noticed the loss of the wheat plant during winter, from the turf lifting after severe frosts, where it has been sown after seeds, and also from the ravages of slugs and wireworms. When these casualties occur in the winter,

mildew is, unfortunately, generally found to succeed in the summer.

As soon after harvest as the stubbles have been properly cleaned by scarifying or forking, as required, the land intended for mangold-wurtzel and cabbage, or kohlrabi, is manured with twenty loads of good rotten manure per acre; and the remainder of the manure on hand is directly applied to the one-year-old seeds, after the rate of about sixteen loads to the acre. No farmyard manure whatever is used for swedes or common turnips, nor for coleseed, experience having satisfied me that superphosphate of lime is more economically used in their production, and that farmyard manure can be applied with greater advantage to other crops, and that, too, at a much more convenient time—viz., on the one-year-old seeds for the last two grain crops in the rotation. No doubt, mangold and cabbage also can be grown without farmyard manure. Indeed, I had a very heavy crop last year, from no other application than six cwt. of the London Manure Company's mangold manure per acre. But, knowing the very hungry nature of mangold and cabbage, and always so plainly seeing in the lighter corn crops following their growth their great exhausting powers, I think the land intended for them should always receive an autumn dressing of good farmyard manure, and, in addition, six cwt. of superphosphate of lime, or some other equivalent, in the spring.

When those portions of the root fallows requiring farmyard

manure are supplied, the surplus is put on the seeds; but, of course, there is not sufficient to go all over them. From October till March affords ample opportunity to make up the required quantity; and this is done partly by carting that which is too long for immediate application to the land into heaps until it is ready, mixing salt with the heap as carted, and covering with soil; and partly with manure taken directly from boxes or yards, where it has been so thoroughly trodden and prepared as not to require the heaping process. The remainder of the manure, when the beasts have left the yards, is carted, and preserved in a similar manner, in convenient spots, for autumn use. If leakage occurs, a small tank is dug, the drainings into which are carefully returned over the heap every morning; or this waste of invaluable matter may be prevented by simply shooting down a sufficient quantity of ashes to absorb the escaping liquor. With these precautions, I believe there is no fear of loss from fermentation; for chemistry has proved to us that ammonia is not given off from the surface of well-compressed dung-heaps, but in their interior and heated portions, and that, in passing into the colder and external layers, it is retained. Neither have I the slightest objection to allow farmyard manure to be spread and exposed on the surface during the winter, but rather prefer it. I remember, in October, 1853, dressing twelve acres of seeds, immediately after the lambs had been taken off them and put to turnips, with sixteen loads of good manure per acre. It was rotten, and immediately finely spread on the surface. The seeds were red clover and Italian ryegrass, which had been once mown. Two acres were left undressed. The field was then rested until the end of January, when, with the exception of the neglected two acres, the dressing had so entirely revived the Italian ryegrass as to have produced most luxuriant keeping for the ewes, and the same comparative difference was observable in the oats, very plainly showing that, though the manure had been spread, and lay on the surface from October to March, yet its virtue had been held by the soil (which was not clay, but deep, light loam), and was abundantly found in the oat crop the following harvest. Such having been my satisfactory custom in the application of farmyard manure to the land for many years, I was well pleased to read in a late number of the *Journal* the following remarks by Dr. Augustus Voelcker: "It appears to me," he writes, "a matter of the greatest importance to regulate the application of manure to our fields so that its constituents may become properly diluted, and uniformly distributed amongst a large mass of soil. By ploughing in the manure at once, it appears to me, this desirable end cannot be reached so perfectly as by allowing the rain to wash in gradually the manure, evenly spread on the surface of the field. By adopting such a course, in case practical experience should confirm my theoretical reasoning, the objection could no longer be maintained, that the land is not ready for carting manure upon it. I am much inclined to recommend as a general rule: Cart the manure on the field, spread it at once, and wait for a favourable opportunity to plough it in. In the case of clay soils, I have no hesitation to say the manure may be spread even six months before it is ploughed in, without losing any appreciable quantity of manuring matters."*

It may be said, is it not considered wrong to apply farmyard manure to white grain crops? Certainly, I have not found it so for oats. They stand high condition of soil better than any other white straw crop. I find the practice justifies the course, having grown oats on this system for many years of a heavy weight per bushel, and a large yield per acre.

And after the oat crop, the land ploughs with a beautiful mellow tilth for wheat; the farm-yard manure which is turned up becomes by harrowing thoroughly incorporated with the soil, and the land is brought just to that state calculated to give a satisfactory return, both in the quality and yield of wheat.

And again, it may be said, can it be right to apply a heavy dressing of farm-yard manure on thin land, even for mangold wurtzel, in the autumn? On the very thinnest soils it may be more prudent to wait till spring before manuring; but I have some very thin soils, and I prefer autumnal manuring for them. This is my plan: and again, I may say very heavy crops seem abundantly to justify it. The manure being spread, I throw the land at once into 27-inch ridges, leaving, of course, that soil underneath the ridge unploughed, and the manure covered up over it. Having lain for the action of the weather, till perhaps the end of January, the ridges are reversed, the remainder of the land gets ploughed and exposed. The manure now become tolerably well incorporated with the soil. Before sowing the mangolds look over the ridges, and remove all strong-rooted weeds: slightly mould up the crumbled soil with a ridge-plough, and drill the seed. I prefer sowing 3 cwt. superphosphate broadcast before moulding up the ridges, and drilling 3 cwt. with the seed. In this way heavy crops of mangolds may be grown on very thin soils with autumnal manuring.

The importance of a healthy and well-prepared seed-bed for all crops is a matter becoming more duly appreciated, and as we have not yet got a "guide-way system" in all our fields, the mechanical force requisite for conveying 20 tons of farmyard manure per acre over a field, say for swedes, and in a watery month of May, must often have a most baneful influence on the physical properties of the soil, independently of the fact that by its very slight incorporation, the young plant gets not that forcing, but healthy growth, which a soil imparts in which the manure has been long previously amalgamated: and no doubt by such commixture and amalgamation a really fertilizing compost is created, well indeed adapted for the early nutrition of plants, as well as their subsequent and gradual development.

It has often occurred to me, from remarking different systems of management, as highly probable, that in applying farm-yard manure to my seeds in the autumn, by its minute subdivision on the surface, then by the gradual washing into the soil of the finer particles by rain, and the subsequent til-lages, that the land is really in as good a state for the turnip crop when that rotation returns, as similar land not so treated is after receiving its heavy dressing of dung just previous to sowing the turnips. Another important advantage is gained in the extra time permitted in the spring for cleaning the land, or for allowing it to rest (and grow successive crops of annual weeds, each crop destroyed by harrowing, and also the additional retention of moisture in a dry season, by allowing longer rests between the tilths.

The autumn and winter, I contend, are the best seasons for applying the manure of the farm to the land. On the one-year seeds you are able to work your staff of men and horses, and that without injury, when land is either too wet or too frozen to do anything else upon it. And if you persist in applying this manure to turnip fallows in the spring because you are not able to get on your wet fallows with the manure-carts, you are compelled to let your time of sowing be driven on too late in the season; or if postponed, the soil, by being worked at an unfit time, becomes converted into a state of semi-mortal, in which turnips never thrive; and thus the whole of the economy of the farm suffers. You have done

* *Journal R.E.A.S.*; vol. xvii., p. 257.

almost the only thing that converts, according to some philosophers' notion, dirt into a nuisance; you have, in fact, put a good thing into a wrong place. As I have previously said, I am convinced that the application of farm-yard manure at all is not advisable for the turnip crop, having repeatedly seen that the produce from 4 cwt. of bone superphosphate has not been sensibly increased by the addition of farm-yard manure. No one entertains a higher opinion of the real merits and value of good farm-yard manure than myself, nor can anyone be more impressed with the necessity of husbanding it to the utmost possible extent; but I hold that two manurings answer far better than one in a rotation, and that turnips are better grown with phosphates, and require less ammonia than corn, and that, therefore, it is better to use the manure of the farm for corn, and purchase stronger phosphatic manures for the turnips.

I believe that Sir Francis Mackenzie was celebrated, on his farm at Carron, for the cultivation of root crops, and I am happy to acknowledge that I was induced to adopt the autumn and winter system of manuring by a remark of his which I read about twenty years ago; and its justice has been confirmed by my observations ever since. "One half the dung," said Sir Francis, "if given early in winter, and ploughed in, will be found equal to double that quantity laid on in the spring before sowing time." And here I may mention a case remarkably bearing out this theory, which occurred in 1859. The first prize for the best five acres of swedes in the county of Rutland was awarded to a crop grown on a farm at Wing. There were many competitors in the class, as well as in other classes for swedes; but one of the judges who awarded the premiums lately informed me that he considered the five acres of swedes at Wing were the *best in any of the classes*. They were the only crop where the farm-yard manure was carted in the autumn, and ploughed in early in the winter. Moreover, adjoining this piece in the same field, where manure of equal quantity and quality was ploughed in only just previous to drilling the swedes, the crop was much inferior in weight.

The autumnal application of the farm's manure on one year's seeds for oats does not give the farmer a slight advantage in the keeping and management of his stock, but a very great one. Seeds are not an inexpensive crop to grow; and retaining them five months longer much increases their value. If we take them up in September for wheat, they are too quickly hurried out of use, and the return for the investment is necessarily lessened. My own system with seeds (and its convenience in connection with both stock and labour is so great that I venture to describe it) is this: In the first year, after harvest, stock lightly till the end of October; then again with ewes and lambs from March to the 1st of May; take one mowing about last week in June: stock with the weaned lambs from the latter end of July until they are put on turnips in October: the seeds are then manured as far as the stock on hand will permit, and rested till the end of Jan., when there is usually a fine pasturage of Italian rye-grass for the inlambd ewes. Having kept down these seeds, now I am able to lay up all grass land, and yet not to confine my ewes to keeping where they cannot get a small picking at least of natural grass. Their lair on these seeds, when all the herbage is gone, is excellent for the consumption of mangolds, or chaff and corn, as the case may be; and the manure of the farm has had the opportunity of doing double duty in producing a very valuable eddish for the ewes, and being of equal, if not additional, service to the following corn crop. I have found the advantage to be even greater on heavier land. On this description of soil, where roots have been grown, the lair is in the winter absolutely unfit for their consumption. Early in the autumn remove a large portion of the crop into camps duly secured in your seed-field; then in the winter, when tilths are killing to stock from their depths of wet mud, on your neighbouring seeds you have a famous lair for them, nice herbage to pick for health, and clean food for the comfort and growth of the stock, avoiding the almost invariable destruction of one or two subsequent crops by the fatal process of treading clay-land in wet weather.

UTILITY OF CHANGE OF PLACE IN SEED, AND STILL MORE IN LIFE CONTINUED BY TUBERS OR CUTTINGS.

THE STAGES OF LIFE OF THE SEEDLING POTATO CONTINUED BY TUBER CUTTINGS.

SIR,—In your last number I tried to draw attention to the importance of change of seed, and especially to have it healthy, and not injured by damp mouldiness, free from the disease and weakness which naturally result from a moist ripening and harvesting season. As the subject is very important I shall attempt to explore it a little further.

1ST. AS REGARDS CEREALS.

For seed grain it is advantageous to have it, if possible, from land which has been in pasture—the older the pasture the better. Here the seed is more likely to be possessed of all the requisite (what is termed inorganic) principles, and have a better-proportioned and stronger constitution, than the produce of soil much cropped under cereals, where the fertility has been kept up by manuring, especially by the small manures. I have found it advantageous not to ripen the seed grain too much before cutting; as the fullest ripening, while it increased the quantity or maturity of the farina-supply, seemed to diminish the strength of, or produce a lethargy in, the germinal organs. It seems also probable, that being

often wet and dry in the field after it is cut, especially if the germinating process is a little started, though not enough to prevent future germination, is still hurtful. Half a century ago I have seen what was termed *dew-ripening* practised with wheat in the South of England (Is it so yet?). The standing grain upon being cut was laid down in handfuls on the stubble to dew-ripen for several days—to be moistened nightly with the dew, and dried every day by the sun. This repeated moistening and drying, expansion and contraction, reduced the flinty and fibry connection of the substance of the grain, rendering it when broken of a soft white floury consistency, like the finest chalk. Although this might be advantageous to the miller or baker, I think it would injure the stamina of the germ for seed. This takes place to some extent when our *stooks* stand for a week or two without hoods in time of dewy nights and sunny days. The effects of this upon the germination and strength of the braid ought to be tested. In testing it, the operator would require to place the trial seeds all at the same depth in the earth. I have found that wheat ploughed down about five inches deep gave a very

different braid from that sown above, and only one or two inches deep. The deep-planted braid-leaf rose much slenderer, and much taller above the surface of the ground, than the shallow-planted, the latter being far the sturdiest braid. In dry weather, however, ploughing down the barley with a shallow furrow, or drilling it deep, is to be preferred, the bottom damp more than compensating for the tall slender form of the braid. In the case of the deep-planted seed there may be a want of oxygen-supply to form the farina sufficiently into a sugary nourishment for the germ. This may, along with the distance it has to rise, account for the slenderness of the braid, but not for the tallness, which must be ascribed to a habit or correlation.

But to return from this digression. In the case of wheat exposed to the dew and drying air, there might take place every night a commencement of the imbibing of oxygen, preparatory to germination, altering the character of the farina. Every dewy evening, the living seed would be stimulated by the moisture, and the moistening would raise up the bran, like sprushed up feathers upon a fowl, to allow the oxygen to be imbibed. Many have been surprised at the effect of a slight damping diminishing so greatly the weight per bushel, and I never found any one cognisant of the cause, which is a little complex. The moisture thus raising up the bran enlarges the size, while it (the moisture) gives a stickiness to the bran surface, which prevents the grains from slipping past each other close down in the bushel. Thus, a quart of water given to a quarter of grain, will cause it to diminish in weight, in each bushel fully as much as the weight of a quart of water, while the wheat will increase in measure some ten times the quantity of water. I have seen the Baltic merchants hoist their wheat up some five storeys high in their lofty granaries, and run it down through bushes of thorns tied the whole distance to the hoisting rope. This rubbed bare the downy end, and polished the skin of the wheat, causing it to pack closer together in the bushel, and weigh several pounds per bushel heavier; of course it would intake more than in proportion. For seed it would not benefit, and might injure.

To recapitulate: the grain of last season's crop, in the greater part of England, is not healthy. From the rainy, ungenial summer, and bad harvesting, it has been seriously affected with mildew of various kinds, mouldiness, and partial sprout; is no doubt deficient in stamina, and by no means well suited for seed. It is, therefore, important to procure a sound article from Scotland—especially oats. In Scotland no brimstone fumes are employed, as in Ireland, to give fair colour. Even although the crop of oats in the south half of England were completely sound, the change of seed from Scotland would be highly judicious. The thickest-bodied oats I have seen in any country—thick in the body as barley—grew within sight of the Orkneys, near Thurso.

2ND, AS REGARDS LIFE CONTINUED BY TUBERS OR CUTTINGS.

I stated, in my last letter, that in the case of seeds proper, attention to change of place is no doubt of great importance; but in the case of tubers and cuttings, much more so. In seeds proper, though the habit of the parent and race—constitutional vigour or weakness, is to a considerable extent communicated, and especially lurking disease, yet the progeny-seed is so far a new individual, often considerably different in variety, and much dependent upon the climate and soil where it has been produced; even the seeds of the same apple, all differ in variety from the parent, and from each other. Here, as the apple blossom is an open flower, the pollen of fructification may be much varied. Even in the case of the seedling of a weak or aged parent, there is something of the fresh-

ness of infancy, the vigour of youth, in the progeny, though inferior to that of a healthy parent or parents. In life continued by tubers and cuttings things are different: renovating infancy, vigour of youth, is wanting. It is not a new individual—new from the nucleus monad, or primal germ cell—but a mere continuation of the same individual, varied only a little by soil and climate influence. It gradually, in the course of years, loses vigour; at least, in most cases that we know of; becoming infirm, and liable to disease, and disappears, apparently sinking under old age. The greater portion of the varieties of the potato, continued by tubers for a number of years, loses even the capacity of producing seed. In continued propagation by cuttings, a number of trees, those of soft wood, and which prosper in moist situations—willows, poplars, limes—do not, however, seem to lose vigour, or become dwarfed in size. The old stag's head, or red wood ozier, the wood of which almost equals oak in durability, is the only species of the willow family that seems to be a little infirm in constitution, being much disposed to canker as if it were too far in years. Most of trees whose habitat is dry ground, even at first, do not acquire strong stable rooting when raised from slips, remain dwarfs, soon come into seed, soon look aged, and soon disappear. Here, one defect seems to be, imperfect rooting. The roots given out by the slip do not even swell out sufficiently strong to sustain the tree from being uprooted by the wind, but remain slender and creeping, comparatively like the roots of quickening grass. In the case of slips of trees of dry soil habitat, being grafted upon seedling roots of the same kind, more especially the natural wild species, life is much longer continued, in many kinds almost indefinitely; but in others we find a disposition to infirmity and disease resembling old age, however young and healthy the root.

Recurring to the potato, the most important vegetable next to the cereals, we find it almost useless in the seedling state. In nearly all seedlings the tubers are not larger than cherries, and with few to the stem. And it is only after the tubers are repeatedly planted in rich soil that they attain their maximum size. When this has been first reached, the form is generally coarse—shoulders, and deeply indented large eyes. This largeness and depth of eye, along with stringy leaders inward from the eyes, indicates stamina of constitution. The colour of flesh is also generally bad, the flavour rank when cooked, and the quality of a consistency the opposite of floury. By repeated planting in good rather dry land a great improvement of form and of quality takes place. The figure becomes more regular, more of the oblate oval, the eyes smaller and more shallow (we see this in excess in the fluke variety, where the eyes, except the strong one at the extremity, scarcely retain the power of germinating), the flavour becomes less rank, the inside whiter and more floury—contains more farina, and altogether the tuber is much improved as a table potato. In Germany, however, where the potato after boiling is generally fried in fat, the choice of the seedling to be acted on and the treatment are a little different, as a well-tasted small waxy hundred-fold variety is best suited for this purpose. To obtain a good-sized potato with much farina and good form from the seedling, some eight or twelve years is required, and considerable tact in procuring and choosing the seedling of most improvable character. To effect the improvement in the shortest time, the furthest-back eyes are to be preferred to those at the point, as conducting more to farina, though of less stamina. It unfortunately happens that when a superior quality is thus obtained, a delicacy of the variety is induced, which requires much care to retain it at its maximum of excellence, or preserve it from decline.

In a variety brought to an excess of farina, old age or degeneracy is impossible to be warded off. The finest are not only most subject to blight, but to curl and other diseases, and in most varieties the vital stamina can only be maintained for a few years by change of place almost every season, and careful attention to choose seed for a low dry and warm situation, from a rather cool situation of considerable altitude, and which has been much under pasture. May I add that greening the seed tubers would also be advantageous.

I am anxious that we farmers keep in advance in natural science, to which our position, the comparatively quiet leisure, solitary walking, opportunity for and customary practice of careful observation in the fields of nature, and daily experience, lead us. A knowledge of the laws which guide the variability of organic life is a most interesting and important branch of science. By acting upon these laws man becomes not only an improver, but so far a creator—able to render existing forms more perfect or more useful, and to produce even new forms of being without end. In my discovery of the fixity of species by natural competitive selection, I have overturned the only argument worth overturning brought forward by ancient superstition against the law of development. I have shown that we can go ahead of college-bred, closet-taught naturalists, and leave them to follow in our wake at the distance of thirty years. This is nothing remarkable, as most of them are mere bundles of old-world prejudices. May I therefore hope for assistance from my brother-farmers, that we may keep ahead?

Let me not be misunderstood here. There are two modes of change in nature—by variation under competitive selection, and by commixture of species nearly allied in the chain of life. In the attainment of new kinds of being, it is chiefly to the latter that we must have recourse, as the former is slow in progress—at least as has hitherto been carried out. There has been much misunderstanding regarding this power of commixture. Every nurseryman of note knows that if the commixing plants be not too wide in the chain of life, the *mule*, as it is termed, is reproductive and healthy. In wild animals too the same fact has been proven in many cases by the keepers of menageries. It is only when the commixing organisms are too wide in character and formation that the progeny is non-productive. There may be, or once there may have been, nearer links in the chain of life. *Species and even genera are, now and then, disappearing from the earth in the wilds of nature. Some equivalent new ones must be arising. This is the whole affair.* Only, in the great geological changes to which the planet has been subject, great loss of life must have occurred, and opened up new fields of extension, placing organisms under new circumstances, and affording more chance of commixture and change.

In the case of vegetable commixture this field of science is not considered improper; nor even is it so in birds, though in quadrupeds it has to some extent been so, in the latter perhaps rightly, as it has embraced those too widely apart. It is only the creature that lives with a false life that is unfruitful, and soon disappears.

The members of locomotion in the higher vertebrates are strikingly similar. Under the law of competitive selection, fins can change to feet, feet to arms, and arms to wings, and *vice versa*, but not this without a pre-ordained capacity. This law guides the organs to improvement, and alters them in accommodation to circumstances should circumstances change, but cannot originate new organs. No modification of this law could originate the hollow fang of the serpent, so formed as in the forcible insertion to press upon the venom-bag at its root, and so squirt the poison into the bottom of the wound; nor

could it plant the rattle of warning on the tail of the most dangerous snake.

Of the arcana of nature, and knowledge of the laws and influences that regulate the chain of life, we are as yet only entered upon the threshold.* Competitive selection embraces the line of utility, not of beauty. This law cannot account for the beauty of nature, especially for flowery vegetable nature† (it would seem only begun to be flowery when man, the only organism that we know of, having an extended sense of the beautiful, came to exist). Nor does it account for the highly ornamental decoration of birds by feather-clothing, arranged to produce united a regular picturesque effect; in both of which—the flowers and birds—the organism itself (the peacock and a few others excepted) seem to have little or no sense of the beautiful; at least no feeling of preference, so as to exert a selecting power, gradually to produce that beauty, as might take place in the case of man. Look at the most ingenious and beautiful construction of feathers, so light, so strong in united effect, so graceful, coloured like the tinged clouds, crimson and gold, of morn and even—both formed of crude matters—both with powers of aerial flight. The law of competitive selection never cultivated this beauty. There are many other phenomena not yet accounted for by general law, in some of which design and balancings seem to appear, and which, remaining in darkness, is a disgrace to the present age. The known effect of sunlight on development, as well uterine as extra-uterine;‡ the power of mind or the will over vital development; the aberrations from the general law of like producing like; the electro-magnetic character of life; the mental or living principle of one organism mixing with and paralyzing and controlling another;—here is work wants doing.

PATRICK MATTHEW.

Gourdie Hill, Errol, Carse of Gowrie, Feb. 26th, 1861.

THE OVER-FEEDING QUESTION AND THE HEREFORDS.—Mr. Williams' "Sir Colin," the first prize Hereford bull at the Dorchester Show of the Bath and West of England Society, and the second at Canterbury, has been slaughtered. The reason will be gathered from what we said of him at Dorchester:—"Sir Colin is a magnificent specimen of his kind, but now, as it would seem, *utterly ruined by over-feeding.*" The judges, indeed, only awarded the premiums to him "conditionally" on his proving of any further use, and it would be important to ascertain if he ever again qualified. Mr. Edwards' "Leominster," a first prize Hereford at many meetings of the Royal and other Societies, and the best bull of his breed at Canterbury, is also dead; but the reason assigned here is from his having sprung a sinew in the hind leg. It was further reported that Mr. Rea's "Sir Benjamin" had been seen in Smithfield, but this we are assured is incorrect, and that he is still in strong work.

* THRESHOLD—the threshing-floor, where the operation of threshing is *holden*; the house-barn or hall of entry to the German farmer's house, allotted to the useful.

† The star and branchy forms made of congealed water upon our windows, by the general law of crystallization, are very similar; the stars to many of our flowers; and the branchy forms to the leaves of plants. This points so far at general law reaching to beauty. The beautiful prismatic order, or rather disorder, of the sun's rays in the rainbow leads in the same direction. We see this also in the peacock's tail.

‡ Supposing this orb to have gradually cooled, a dense cloud of aqueous and other vapour must have existed after life had come to exist, the gradual clearing away of which by condensation and increase of light may account for the progression of being: I have often wished I had opportunity to follow out this by experiment.

THE "NEW" NUMBER.

Look sharp! is the pass-word of the age we live in, when "Better never than late" has become a far more popular reading of a musty old proverb. *Bis dat qui dat cito*, is the law of the land; and punctuality holds a place amongst the most honoured of virtues. Her gracious Majesty opens the House, or sits down to dinner to the very minute she has ordered it. The Holyhead Express would not wait ten seconds for the Prime Minister of England; and the great Duke himself did his duties by clock-work. We get even occasionally beyond this, especially in the conduct of that important principle, the Press. The electric wires now habitually anticipate the arrival of the Mails and "the latest intelligence;" we have new Monthlies out two or three weeks before the time they are supposed to be due, and *Punch* is old and soiled by the day it is dated for. The very morning papers give us to-morrow's news in a second edition of this afternoon; while many of the weeklies have closed their columns before the week is half over; and you can always get the *Sunday Times* on a Saturday.

But this hot haste may not be everywhere so acceptable, and the farmer especially is taken to be one of those not inclined to hurry himself. However correct this tradition may be at the present time, some of his friends are still quite willing to respect such a feeling. He, at any rate, shall not have his periodical born prematurely days or weeks before its time, but, on the contrary, he would seem to prefer it two or three months after date. For this reason it must be that the Christmas number of the Royal Agricultural Society's Journal is circulated in March, and the Midsummer-day part at Michaelmas. We say this with all proper seriousness, for it would be really almost impossible to suggest any other just cause or impediment. There is not ostensibly a paper in the new number of the Journal that could warrant the delay. The majority of the articles either were or should have been finished months since; or, in any case, would have suffered but little from standing over. Then, as regards the contributions of more immediate interest—that is, the Reports of the Judges on the Canterbury Show—the first query would be, why they did not appear in the previous number, considering that was not published till September, and the meeting was held in the middle of July? Not but that these Reports are for the most part very carefully made by the different "sets" of judges engaged on the trials of the implements; but these deal chiefly in facts and figures that must have been noted at the time, and ready, at the furthest, long before Christmas. We thoroughly agree, however, with the exception made by Mr. Caldwell, the Steward, to the Report from the Judges of the Miscellaneous Department. It is little more or less than a direct puff for most of the things brought before them; and we say again, with Mr.

Caldwell, that this department wants looking to. The two Judges, indeed, support the recommendation, in their inventory of the cucumber slices, bedsteads, carpet-sweepers, cork-drawers, dish-covers, fishing-rods, photographs, union jacks, and other agricultural implements of high aim and character which they were called upon to inspect. Mr. John Clarke and Mr. W. Tindall must be two gentlemen easily pleased, to have found the good in everything that they seem to have done. Their duty, the rather as it strikes us, should have been a resolute remonstrance against the mass of absurdities—sent simply as advertisements—that they wasted their time over.

Mr. Frere himself disposes of the Stock Show at Canterbury in three pages, and in which he does the MARK LANE EXPRESS the honour to quote our own sketches, as given at the time of certain distinguished prize winners, such as "Royal Butterfly" and Barthropp's "Pilgrim." The Editor does so with the following graceful acknowledgment in the outset: "After a lapse of several months, few subjects lose more of their attractiveness, both for the writer and the reader, than that of an agricultural show. Graphic accounts of the Canterbury Meeting appeared at the time, from the pens of writers whose speciality it is to enlarge on the beauties and merits of high-bred stock. To copy these would be plagiarism: to vary, but to change them for the worse." The Editor's own remarks are further supported by a Report from the Judges of Shropshire Sheep, in which they speak in the highest terms of the entry, and recommend that for the future the breed shall be placed upon an equality with other sorts, as regards the number of prizes to be competed for. This brief summary is followed by a novelty in the pages of the Journal, but a most acceptable offering. It is called a "Report on the Riding Horses and Ponies shown at Canterbury, with Remarks on the present Breed of Riding Horses," and is supplied by Mr. Earle Welby, one of the judges. It is acceptable, we say, as directing attention to a feature the Council is at length encouraging in a degree something equal to its importance; but it is by no means a paper we are inclined to altogether agree with, though Mr. Welby's opening is after many such an argument of our own: "First, on Class I.—'For thoroughbred stallions for getting hunters,' &c., for which £25 and £15 have been the rates of remuneration, I would venture to remark, that having watched this class since the establishment of the Royal Agricultural meetings, I have come to the conclusion that it is one which in all districts is worthy of the patronage of the Society: it gives variety to their shows, it attracts a number of people who are not much interested in the beasts and sheep, and so adds grist to the mill; and, if only the prizes be liberal, and

so worded as to ensure the entry of the most valuable horses, available for general use in the field and on the road, it must command success in almost every district, for all Englishmen love a horse, especially those of the northern counties. Yet ever since the Royal Agricultural Society first instituted this prize, the class has been but a small one, owing to the fact that owners of valuable horses are not to be tempted to send to a distance under a prize of £100. The entries have therefore been generally restricted to those kept within easy distance of the show. At Middlesbrough the example (which I am happy to see the Royal Agricultural Society intend to follow at the ensuing Leeds meeting) of giving £100 was a decided success, inasmuch as it brought together a show of fine horses. No doubt it was won by the best, *Voltigeur*, and possibly (but this was a question) the second-best was *The Cure*." But Mr. Welby proceeds to make this monstrous suggestion: "This leads me to suggest that in *Class I.* it should not be deemed absolutely necessary that it should be for 'the best thoroughbred stallion, but for the 'best stallion' for getting hunters, &c., 'pedigree being especially taken into consideration.' I see, however, that the prize at Leeds is published for the 'best thoroughbred stallion'; and though I doubt not the quality shown will not be found in any way deficient or unworthy of the £100, yet it is on the cards that a fine specimen of the high-bred hunter might be disqualified from competing by the insertion of the word 'thoroughbred.'" Of course Mr. Welby supports this view by certain arguments of his own that we have not space to enter on here; but we say decisively against his recommendation that there is no greater mistake than attempting to breed hunters by half-bred horses out of half-bred mares. It may tell occasionally, but as a rule there is nothing so uncertain as breeding from two cross-bred animals. It is the very error, as Mr. Welby himself says further on, that farmers have been too prone to commit—that is patronizing "mongrels." In the course of the year we make it our business to attend all the agricultural shows of any importance, where we have seen more than one highly-bred "cocktail" disqualified after the prize had been awarded him, simply on account of the stain; while we do not remember any meeting in England but where one of the first conditions for a hunter-getting stallion is that he should be thorough-bred, and we hope we shall never see it otherwise. The Royal Agricultural Society will only undo all they have ever done for improving the breed of hunters, especially as bred by farmers, when they act on Mr. Welby's recommendation.

We have dwelt here on that portion of the *Journal* for which many exhibitors have been so long looking. The more elaborate papers will require more study. The part opens with a long semi-official Report by Mr. Rainalds, the Vice-Consul at Copenhagen, on "The Agriculture of Denmark," and it finishes with a digest by M. Trehonnais, of Lavergne's "Rural Economy of France." Professor Voelcker supplies another of his standard papers on "The Value of Foreign

Phosphorites and Coprolites;" Messrs. Lawes and Gilbert enter with their customary energy on "The Composition of Oxen, Sheep, and Pigs"; and Mr. Herbert supplies some further statistics on the Supply of Live Stock and Dead Meat. The Prize Essay of the number is by Professor Tanner, on the Application of Manure; and Mr. Frere centres his strength in so seasonable a subject as "The present Aspect of Steam Culture." Another article, by Mr. Voelcker, on the Yellow Lupine; with one by Mr. Heathorn on a Course of Cropping adopted in Kent, make up the way-bill of what a correspondent complains of as a coach terribly behind time. But one word more on this now standing grievance. On the same day we received the new half-yearly number of the English Society's work, due at Christmas last, and the quarterly part of the Highland Society's Journal, ready for March on the day it was delivered. The great Scotch agricultural authority also talks learnedly of horses, ancient and modern; but though he does us the honour to quote us, we cannot compliment the writer on his treatment of so attractive a subject. He sits him down to sing the praises and make authority of "The Horse and his Rider," by Sir Francis Head—one of the most signal failures we know of. A book, in fact, that everybody was ready to respect—till he read it.

TEETOTAL PLOUGHING "DAYS."

At Scales farm, near Richmond, Yorkshire, Mr. Wm. Wilson (formerly of Skeeby) held a ploughing day on the 7th of February, on strictly teetotal principles. The men had plenty of coffee and spice-bread at ten o'clock, at noon a good dinner, and between three and four o'clock in the afternoon plenty of coffee and spice-bread. At Wharton, within three miles of the above place, Mr. Harker held a ploughing day on the same principles—no alcohol in any shape, but plenty of coffee, plum pudding, and beef, and we hear of few complaints: of course there are some "thirsty souls" who would like a beer-barrel in the field continually. At Union House farm, near Skeeby, about two miles from Richmond, R. M. Jaques, Esq., of Easby Abbey, held a ploughing day on Wednesday, March 13th, on the same principles—no strong drink at all—coffee and spice-bread at ten o'clock; also just before dinner each ploughman and driver was presented with a shilling each. At half-past twelve at noon a first-rate dinner was served up by Mr. and Mrs. Hall, Temperance Hotel, Richmond—splendid plum puddings, first-rate beef, also coffee to drink after dinner. Again at three o'clock come on bread and coffee, as before. The men worked like men; they appeared quite cheerful, contented, and happy. We heard no profane swearing or lewd jests, and the men are more likely to return home like good fellows, and be fit for their regular work on the morrow. If we mistake not, great credit is due to Mr. Wm. Wilson, Mr. Harker, R. M. Jaques, Esq., also his worthy agent, Mr. H. J. Turner, of Richmond, for their example by facing the old custom of giving strong drink, which deceives men, and makes the ploughman, as well as the gentleman, "not wise." We were pleased with a remark from Mr. Turner to this effect, that farmers generally sent to ploughing days a valuable team, if they had one, sometimes worth £100. The men are generally primed with drink on those occasions, and the valuable team of horses are left to the charge of a man who cannot take care of himself. We hope the day is not far distant when all ploughing days will be conducted on the same safe side, also all other work, whether farming or otherwise. A vast amount of trouble and vexation would be prevented, to say nothing about the gain in pounds, shillings, and pence in the long run. Let the men be well treated, mix a little silver along with kind usage, and no one need to fear a teetotal ploughing day.—*March 15.*

THE PLANTING OF THE POTATO.

As the season for planting the potato is at hand, I venture to make a few remarks and to give a few practical suggestions upon potato culture. I do not presume to offer anything new or novel in management, but a few plain general observations, and directions which the inexperienced potato-grower may find useful, and to remind the experienced man of the necessity to keep close to the best practice, and to be unusually careful to plant none but the most approved varieties.

The Preparation of the Seed.—The first point is *the land*.—The land or soils best suited for the cultivation of potatoes are mild loams. Retentive clays or sandy soils are not well adapted to the growth of potatoes. Strong loams do much better; and good peaty soils answer well. Sandy loams, where the loam predominates, is an admirable soil for potatoes. Upon this point I would venture to observe that any soil of reasonable depth might be truly adapted to the growth of potatoes by culture. We cannot sufficiently estimate the value of deep cultivation. By it we can prepare the soil—yes, any soil—for almost any crop which the farmer may incline to grow upon it. In this way the modern system of cultivation by steam power will achieve great things. By it heavy clays will soon be turned into strong loams, and strong loams into those mild soils, which, of all others, are the best, and constitute the perfection of potato farming.

The preparation of the land for the potato crop ought to commence immediately after harvest, or, at all events, immediately after wheat-seeding. The land to be chosen would depend much upon the rotation of the farm. The potato crop is generally a substitution for the fallow crop—if so, the first business should be to manure it; for it is found that where manure is recently applied before planting, the crop is sure to suffer most from the potato disease. The management should consist first of deep ploughing—certainly not less than eight inches deep: the manure, where applied, to be very carefully turned-in. Early in the spring the first thing is, either to cross-plough it, or drag through it, by steam power or otherwise, cultivators to the full depth, and presently afterwards to re-cross it: all to be done in fine weather, otherwise no free or open mould will be got, which is so essential to the prosperity of the crop. The harrowings and other workings must follow, so as to bring it into a thoroughly pulverized state. When this is attained, it is fit for planting—only awaiting a suitable time.

The Modes of Planting.—These are various. The most common mode is to plant every third furrow. Another mode is to open the soil, plant along the open, and close the soil again, as in ridging. Another is to plant along the prepared soil by spade, making crevices at proper intervals, into which the plant or set is

dropped. Another is to form beds, or plant along the surface, leaving a space, which is dug out, and thrown over the top: this is called the “lazy-bed” system. Another is to make a trench with the spade, plant the sets, and hoe the trench in. This is the general garden practice. For ordinary field practice the third furrow system is the best. Two furrows are opened the whole length of the field, so that the planters are planting the two furrows on the one space while the other is preparing, and so on throughout the field. The distance from set to set is of great importance. If too near, the potatoes are small and numerous, but not marketable. The experience of a great many extensive growers, farming in the district from which I write, proves much in favour of wide intervals; none planting at a less distance than ten inches apart, while many prefer fifteen inches as the minimum interval, providing the sets are large and sound. My own practice, derived from long experience, has settled down to planting from eleven to thirteen inches as the intervals from set to set, not including the set itself; depending, however, much upon the variety planted, early potatoes being planted nearest, and large haulmy varieties the further distance. It is a great point to have them so planted as to produce the greatest quantity of marketable potato, *i. e.*, the greatest weight or number that will not pass through the meshes of an inch and quarter riddle. If the object is merely to grow seed potatoes from a new or approved variety, by all means plant them at narrow intervals, and from sets with plenty of eyes; but if the object is to grow a marketable crop, by all means plant them at wide intervals in the rows, at the same time having a wide space between the rows. This will be found the best practice in planting.

The size and preparation of the sets is another matter of great consequence, and is not well understood by ordinary planters. Every perfect eye in the set will produce a shoot or stalk, which will require room and nourishment, and will produce fruit or tubers. These being so close and crowded will of course be stunted or restricted in their growth; hence the whole crop will be small and unsaleable as food. To obviate this the set should all be looked over, and any superabundance of eyes must be cut away, so as to leave not more than two or three good eyes at the most. The cutting away of “the rose” is often sufficient, as that part of the potato contains the most eyes. When this department of the business is carefully attended to, the potato set will only throw out one, two, or three strong healthy shoots, which rapidly get away into a fine full growing potato plant, vigorous and promising; but with many eyes we have many shoots, all weak and tender, and their produce not exceeding a walnut in size; here, in a great measure, is the clue to the fact of the stunted growth of so many of our potato

crops. The size of the set is not of such importance as many are led to believe; it ought, however, to possess full vitality, and perhaps the larger the set the better. The planting of eye-sets, of course, adds much to the cost; a good-sized potato should make at least two sets, and in many tubers three. No set ought to be smaller than a walnut, nor need it be much larger. I do not think it good practice to plant small potatoes whole, except they are carefully looked over in reference to the number of eyes. If they are found to be right, then their being whole is unimportant. As to the operation of depositing or placing the set, it is desirable that the most vigorous eye should be uppermost, so that no hindrance to its quick growth takes place; a little care on the part of the setter will suffice for this.

I do not propose in this paper to embrace or discuss the whole subject of potato culture, but merely the putting-in of the crop. It may, however, be right to offer one or two suggestions of a general character. It has been urged that, to dry the sets will greatly tend to prevent the attack of the potato disease; many of mine were nearly dried up last year, but I had quite enough of the disease. True, they were dried under a hovel by long exposure to drying winds, uncovered—not by stove heat. Wherein lies the difference? Dusting the sets with lime or gypsum is said to be efficacious. I have not found it so with lime; gypsum I have not tried. Manuring with lime and salt is another of the many safeguards adopted; it also proves unavailing. Peruvian guano, again, is extensively used, and with this good effect at least, that it so promotes and stimulates the growth of the crop, that it forms good and

large tubers at a very early period. Manuring with farmyard manure immediately before planting is decidedly conducive to an attack of the disease; it ought to be applied in the winter, if requisite to its fertility. A dry soil and a dry season conduce much to the safety of the crop; ungenial weather and a wet soil are fatal. The approved varieties for planting are but few. If a new variety is introduced into a district untainted with the disease, it seldom lasts two seasons. The “fluke” potato in the past season stood here better than any other. On soils that could not be kept dry they constituted our best crop. In one instance coming under my own knowledge the crop was free, owing to the dry rich loam where they were grown. The “snow-balls” came next, but suffered severely. Regents were almost a failure. Ashleaved not their own again. The highest quotations this week run thus: Flukes 160s., Regents 120s., Dunbar ditto 180s., North Berwick ditto 125s., Perth ditto 105s., Perth rocks 100s., Scotch cups 110s., Scotch rocks 105s., French whites 90s., Belgian ditto 80s., Dutch ditto 80s., and other kinds 80s. These of course form the prevailing varieties, for which, on application to a London salesman, any grower may obtain seed, and which he will get at about two-thirds the average price of “the heads.” An intelligent London salesman is, upon the whole, the best person to consult as to the sort to be grown; and in making application a description of the soil should be given, and the district where situate should be named. I would only make one further remark; it is this: It is imperatively necessary to the prosperity of the crop that the land be kept dry; certain failure is the alternative. P. F.

THE OIL-SEEDS OF COMMERCE.

Great as has been the extension of commerce and the progress of agricultural supplies within the last few years, they are yet far from commensurate to the wants of Europe. It is therefore a wise provision that new discoveries arise either out of the progress of science or the extension of foreign agriculture to meet the increased demands. When the oils yielded by the whale fisheries declined, and by their enhanced price became expensive, and inadequate to the wants of the consumer, increased attention was given to the production and manufacture of vegetable oils, and enormous quantities of oil-seeds for crushing, from Europe and the East, and solid oils from Africa, were obtained. Even these, however, large as have been the imports of late, were insufficient to meet the progressive demand; and now additional supplies of rosin oil and mineral oils are coming forward, obtained either from coal, or from asphalt and petroleum. The mineral oil springs in some of the States of America have turned out complete fortunes to the owners of the land, so cheap and abundant is the

spontaneous supply from the wells sunk, and so easily is it purified. The vegetable oils, however, provide, and will long continue to do so, the bulk of the consumption.

The importation of the oil-seeds and oil-cake is a matter in which our readers necessarily take an interest, and therefore we may with propriety draw attention to the growing trade. Four years ago, when writing on this subject, we gave the statistics of the imports of seed and cake for a series of years; but these by comparison now look exceedingly trivial. In 1855 our imports of linseed were but 757,000 qrs., and of rapeseed 162,352 qrs. Last year the imports were 1,255,000 qrs. of linseed, and about 300,000 qrs. of rapeseed. So with oil-cake: the foreign imports, which in 1855 were but 80,659 tons, rose in 1860 to upwards of 100,000 tons.

Besides the two principal oil-seeds already named, we imported in 1859 about 183,000 qrs. of poppy, sesame, sursee and unenumerated oil-seeds. The specific returns of imports of these for last year are not yet published by the Board of Trade.

While the consumption of oil and oil-seeds was so much larger than usual last year, the stocks held

* I am aware that artificial heat of a sufficient temperature to destroy the virus is the grand secret; but what a difficult matter for growers to undertake!

are exceedingly small, and prices high. The manufacture of linseed oil in the United Kingdom in 1860 was estimated at 65,000 tons; of which 33,700 tons were exported. The home production of oil-cake was also considerably in excess of former years. The stock of rapeseed held was only about 18,000 qrs. at the commencement of this year, while of poppy and Niger seeds there were none on hand. Rape and seed oils, we are told, continue to sustain the same prominent position in our markets they have done for years past, and independent of a large home make, 9,500 tons were imported into the kingdom last year.

A new kind of grease made from rape oil is now manufactured at Leipzig. The mass of grease, or fat, is quite pure, without taste or smell, and according to medical certificates, contains nothing in the least injurious to health. In cookery, it answers fully the purposes of butter, with the advantage that, instead of the usual quantity of butter, one-third in quantity of this rapeseed grease will suffice. The butter sold in London is bad enough, in all conscience, and we therefore trust that, for edible purposes, the rape-grease may be kept by our German friends.

The ground-nut, as it is popularly termed, the subterraneous fruit of the *Arachis hypogæa*, is now cultivated very extensively as an oil-seed, especially at the Gold Coast, Gambia, and Sierra Leone, on the West Coast of Africa. We imported in 1859 1,124 tons from the Gambia, 1,116 tons from Sierra Leone, and 147 tons from the Gold Coast. But large quantities are sent direct thence to France. Thus in 1857 13,554 tons of ground-nuts were exported, of which 11,300 tons went to France, and 1,300 to the United States. From Sierra Leone 243,123 bushels were sent away, of which 206,503 went to France. The French imports from their own African possessions are also considerable; and it is stated that from 70,000 to 80,000 tons of ground-nuts are annually received, chiefly at Marseilles.

In the Southern States of America its culture is much attended to, and there, and in parts of the West Indies, it is called pindar and pea-nut. In Brazil it is known under the name of mindoubi. In Natal and the Cape, as well as in the Indian Présidencies, the ground-nut is now extensively grown; and in Spain and Algeria it is found to rank among the more advantageous objects of field cultivation. The price has of late been steady in our market for them at £16 10s. per ton. The prepared oil, expressed from the seed or kernel, is of the finest quality, and fit for some of the most delicate purposes to which oil is put. Under the name of Gingelly and Teel, quantities of sesamum seed are imported from India and Egypt, and occasionally from other quarters. The small seeds are of all colours, varying from white to black. When carefully pressed, sesame oil is quite equal to the best olive. On the coast of Africa and in some parts of the West Indies sesame is called bennie seed.

Cotton-seed oil is now a large article of commerce, its seed being abundant, and the difficulties of removing

the husk having been got over. In cotton-seed the oil is in smaller proportion, and the albuminous compounds larger than even in the best linseed cake.

There are other seeds, of less commercial importance, which are occasionally used to obtain oil from, among which may be enumerated pumpkin, melon, and cucumber seed in India, and also under the name of Agusi, in Western Africa; dodder-seeds, or gold of pleasure (*Camelina sativa*) in the south of Europe and Canada; sunflower-seed, cress-seed, niger-seed, the small black seed of *Guizotea oleifera*, called "ramtil" in India; radish-seed, and safflower-seed (*Carthamus tinctorius*): the oil of this makes excellent soap. Mustard-seed is also pressed for oil.

We have confined our remarks entirely to the oil-seeds properly so called, distinct from the oils obtained from nuts and other vegetable sources, which furnish so large a proportion of the supplies—as the palm, cocoanut, olive, bassias, vegetable tallow, and wax, which can scarcely be looked upon, in an agricultural point of view, as objects of agriculture, although they are of high importance, both to the producer of the oil, the merchant, and the manufacturer.

Professor Anderson well observed, some time ago, that the introduction of new oilseeds into commerce is a matter which very much depends upon the farmer; for, in the more familiar seeds, such as linseed and rape, the value of the cake often exceeds half that of the seed, and the price obtainable for it is a matter of the utmost moment to the manufacturer, who cannot afford to use a seed unless he can sell the cake to the farmer. He must be guided also by the proportion of oil the seed will yield in the press, and hence a knowledge of the quantity of that substance contained in them is of importance to him. A knowledge of the composition of these oil-seeds is important also to the farmer, because it is quite possible that some of them may be sufficiently low-priced to permit them to compete advantageously with linseed, which is occasionally used, more particularly for feeding calves, although its high price necessarily restricts its employment.

We may, hereafter, touch upon the composition and comparative feeding properties of the oil-cakes obtained from many of these seeds, whether home-made or imported.

WASHINGTON'S LOVE OF HORSES.—The President's stables in Philadelphia were under the direction of German John, and the grooming of the white chargers will rather surprise the moderns. The night before the horses were expected to be ridden they were covered entirely over with a paste, of which whitening was the principal component part; then the animals were swathed in body-cloths, and left to sleep upon clean straw. In the morning the composition had become hard, was well rubbed in, and curried and brushed, which process gave to the coats a beautiful, glossy, and satin-like appearance. The hoofs were then blackened and polished, the mouths washed, teeth picked and cleaned, and, the leopard-skin housings being properly adjusted, the white chargers were led out for service. Such was the grooming of the ancient times.—*Recollections of Washington.*

FROM THE LOOK-OUT.

The influence of the emancipation of the serfs in Russia, will be deeply and widely felt. The wisdom of the Emperor, in struggling with his reluctant nobles, to bring about this great act of justice in favour of 3-5ths of the Russian people is beyond all praise, and will give him a reputation as the founder of the true greatness of Russia future, higher than that obtained by Peter, as the author of the empire's original design. Indeed, if Peter is to be esteemed the founder, Alexander II. may fairly be considered the preserver of the empire. By this means alone could he stay the downward movement of the nation. Free labour will do for Russia what it has done for the sister-countries of Europe. The same change from which we date our commercial and political new birth, is now going on throughout the populations of that vast empire. When, in the eleventh century, the feudal government had degenerated to a system of oppression, and the people of the cities and villages were held in subjection and dependence by some great lord, being amenable to his arbitrary jurisdiction; when services menial and disgraceful were extorted without moderation; when the common people were deprived of the most natural and inalienable rights of manhood; when they were not allowed to dispose of their effects by will, appoint guardians to their children, or marry without the consent of their superior lord, they had few motives to industry, must have been poor and wretched, and, indeed, are so exhibited in the page of history. There are, we know, some who paint the life of the slave in the most mellow and pleasing colours. His brow is unfurrowed by care, and his heart pulsates with joy, while he leans with childish faith on the love of his master, and depends upon his hand for the supply of daily bread. Admitting the truth of such representation, there is yet one hard fact to overcome. True progress is never found in connexion with slavery. The cities of Europe in the eleventh and twelfth centuries exhibited this truth forcibly enough. But, no sooner were they formed into bodies politic, governed by magistrates chosen from among their own members; no sooner had the blood of freedom pulsed through the veins of the labouring community, than the spirit of industry was born, and commerce flourished. Population increased with independence, and the conveniences of life with the means of procuring them. The activity of genius was awakened; and a numerous class of men, who had formerly no political existence, were restored to society, and augmented the force and riches of the state.

It becomes important to consider in what way the sudden liberation of this latent element of free labour is likely to act upon Russia, and re-act upon Britain.

So far as the nobles of Russia are concerned, they present a rather deplorable picture. They are very much out at elbows—decidedly seedy. They have a great taste for continental languages, for travel, for

recherché dinners; but very little taste for business, and very little real care for the improvement of their landed estates. The incomes on which they live, are, of course, drawn from this source mainly, the land being cultivated by the peasants, under the direction of agents, who usually transmit the needful to the absentee lords, and they were augmented by the "obrok," or rent at which the personal freedom of the serf was leased out to him. But this sum is generally insufficient. The position of a noble seems to have been estimated by the number of serfs he possessed, and pride induced him to keep far more than he had any use for. Thus, to support his extravagance, his agricultural serfs have been oppressed, while his house has been filled with a lazy tribe of domestic slaves, to support his family escutcheon. Under these circumstances, the land having no inducement "to yield her increase," it is not to be wondered that the pawnbroker obtained considerable employment. The pawnbroker in this instance happened to be the crown, who, from such sources, has of late years, added to its domains a large extent of territory, with the people attaching thereto.

One would say that any shock which should arouse the nobles from this state of stupor, and give them a worthy object in life, would prove a great blessing. This, at least, is our British feeling. But, of course, the parties so aroused must be expected to take a very different view of the matter. The nobles not only objected to the reform in itself, and because it is opposed to their prejudices, but they objected to it because they were called upon to make sacrifices. They in fact, put forth objections very much like the following: It might perhaps be tolerated to be called upon to liberate the serfs on a certain compensation being made, but to receive a mandate to cede six or seven acres of land with each slave we liberate, is tantamount to ruin. Surely it is enough to relinquish our feudal privileges, without relinquishing our paternal acres. Many of us have a greater number of serfs than acres, and it seems intolerable that we should be obliged to purchase the land of which we are deficient?

The merchants and burghers, a class between the nobles and peasants, though they number men of considerable means, and who would in another country have become merchant-princes, have scarcely arrived at the middle point between the noble and the moujik. The pressure of cast is very heavy, and the guild dues are still heavier: both act as a dead weight upon industry.

The peasants of Russia are not naturally characterized as hard-working, pains-taking, or patient. It is said they have a shambling method of doing their work. The mechanic rarely perfects what he has in hand: throughout the whole class there is a want of thoroughness; but how far the characteristic want of the spur is induced by long subjection to it, affords matter for con-

sideration. Is not all this evil owing to the competition of that natural principle of self-reliance which is born with men, but which, broken down and overcome by slavery, gives place to national pauperism, well represented by the human body, with the life-blood sucked out of it?

The reform, then, will begin by placing the purchase-money of the serf's liberty into the hands of the nobles. These gentlemen will be freed from the obligation to support the poor and sick by the cession of a certain portion of land, to be funded for that purpose, and may go to the cultivation of that part of their estate which remains to them, and then develop by means of the capital thus received its resources, calling to their aid free labour, and all the wonderful appliances of modern agriculture. Should it please them better, they may carry their capital to the mining districts, and give to their mineral resources a totally new importance in the commercial world. To them and to the country the reform so reluctantly yielded, nay, so doggedly resisted, must be fraught with prosperity and salvation. This increase of wealth to the country will relieve the industrious merchant from the heavy weight of taxation, and impart a new stimulus to him. More of the conveniences and luxuries of life will be demanded, which he must supply. His office, that of distributing the productions of industry, will be more than ever called into use, and he perforce must rise in importance.

And what shall we say of the effect to the country of some 20,000,000 of men working energetically for their own benefit, who have been accustomed to work idly for that of another? What is to be expected when the freed man begins to taste the fruits of his own labour? when new prospects open to him, and new incitement offered to ingenuity and enterprise are felt?

We have risen from indigence to occupy the first position amongst the nations, and date our rise from the removal of feudal bondage from the busy hands of in-

dustry. The mineral wealth of our country was before that period undeveloped, our fields were uncultivated. So soon as the incentives of self-interest were felt, and the right of property depended no longer on the will of the lord, but were upheld by impartial courts of jurisdiction, the capital, tempted by security, issued from the fenced cities, and employed starving labour to plough and sow the fields, to work the mines, and to busy itself in the various methods of profitable production. For the result we have only to say, "Look around."

And is there any special reason why the same causes shall not produce like effects in Russia? Should energy, push, and love of enterprise ever characterize the Russian, as it does the Englishman and Scotchman, and be brought to bear upon the soil of Russia, of which it is said that in no other country in Europe can corn crops be raised at so little expense of labour, what marvels of production may we not expect to witness? Her mineral and agricultural products, raised by free labour, and circulated, under the fostering rule of free-trade, by a complete system of railway communication, will give to Russia a power and importance amongst the nations greater than the dreams of Peter the Great or the ambitious Nicholas ever gave it.

Should such be the result of the present reform, we may look to Russia as ultimately the granary of Europe. Although the mainspring, free labour, has at last been inserted into the national machinery, considerable time must elapse before its parts, newly fitted, will be found to work freely. There will be stoppages and hitches now and then; a band here will be twisted, a spindle there will require oil; there may be a little fouling occasionally. The time occupied in preliminary adjustments depends on the cleverness of the engineer. The experiment to the British farmer is a very interesting one: let him watch it, not with fear, but with attention.

F. R. S.

THE ALPACA IN AUSTRALIA.

From time to time, for several years past, we have drawn attention to alpaca wool, and our foreign supplies of wool. Recently we noticed prominently the deficiency in the general supplies of the raw material for our woollen manufactures, and a very interesting paper on the introduction of the alpaca into Australia, read at a recent meeting of the Society of Arts, offers a fitting opportunity for present comment. There are two great experiments in connexion with our national prosperity which will probably take the lead of all others during the next quarter of a century, viz., the growth of cotton in India, Africa, Australia, or South America, and the increased production of wool. The acclimatization of the alpaca in Australia simply means the growth of more wool. There are several kinds of these animals indigenous to South America, whether all distinct species or mere varieties is

still a debated point. The guanaco is the largest, but can scarcely be classed as a wool-bearing animal, its coat being short, coarse, and intersected with hair. The meat is the best of the class, and highly esteemed. The animal is very seldom domesticated. The vicuña is the smallest and most graceful animal of the species; its wool is finer, and more valued than even that of the alpaca; but the yield is very small, seldom exceeding a pound a year. Like the chamois, the vicuña inhabits the highest tracts of land. The llama, the larger and least valued of the domesticated animals, is used as a beast of burden, carrying a load of from 60lbs. to 150lbs., and travelling about three leagues a day. Of these there are stated to be as many as 1,800,000 employed in Bolivia and Peru carrying produce to the coast, or from the mines. Their wool is principally consumed in the country to the extent

of about 6,500,000lbs. annually, for sacks, cordage, and carpets. Those used as beasts of burden are never shorn, their wool serving the purposes of a pack.

Thus much for the allied animals; but it is with the alpaca we have chiefly to deal, which though of inferior size to the llama, produces a much finer and longer fleece. The Peruvians have hitherto guarded this animal with scrupulous jealousy, and endeavoured to confine it to their own country by the most stringent prohibitions and penalties against its shipment. Mr. Charles Ledger, a merchant who has had more than twenty years' local experience, set himself resolutely to overcome the difficulty, and matured a plan, which he ultimately executed, of getting a large flock out of the country over the frontiers into the Argentine republic, and thence to a Chilian port, for shipment. This was only accomplished, however, after great difficulty and serious loss. The vast success that had attended the introduction of the Merino sheep into our Australian colonies, and the supposed suitability of its climate and vegetation to the alpaca, led to many attempts being made to introduce them there without success. Mr. Ledger, however, in December, 1858, succeeded in landing a flock of 276 at Sydney; which were sold, in the April following, to the New South Wales Government. The history of Mr. Ledger's adventures, troubles, expenditure, and ultimate successes were detailed by his brother, Mr. Geo. Ledger, at the meeting of the Society of Arts.

In endeavouring to estimate the capabilities of a country for the successful and profitable maintenance of an animal new to its history, we must look first to its climate, and secondly to the food which it produces, and see if the one is suitable, and the other supplies what is required by the animal for its full development. An animal cannot be regarded as perfectly acclimatised until it is demonstrated that it can live in the locality to which it is introduced, as well as in its native country; that its produce can be turned to useful purposes, and that agriculturists will find their advantage in breeding it on an extensive scale.

It appears, from the experience of nearly two years, that the climate and pasturage in Australia (New South Wales particularly) are suited to the alpaca. Even the *ichu* grass, its favourite herbage in Peru, is found indigenous there. The animals also attain maturity earlier than in South America, several instances having occurred of ewes under two years bearing lambs. The course of breeding has already arrived at the fourth cross, and the appearance of the animals, as the breeding progresses, encourages Mr. Ledger to expect that he will ultimately produce a finer animal than the alpaca of Peru. The experiments of the naturalisation

of the alpaca in Australia have been so fully and successfully carried out, that the alpaca may now be looked upon as an Australian animal.

The idea of conferring on our Australian colonies the immense advantages anticipated to follow from the introduction of an animal so valuable as the alpaca, appears to have almost simultaneously presented it to the minds of several individuals. Mr. Ledger, although the most extensive importer, was not the first to introduce them. Mr. Titus Salt has sent out several to South Australia. In March, 1857, four arrived, and were located at Port Lincoln; and in July, 1858, five more were sent out. These, however, have not been so successful, the flock being too small, and several have died. A flock of 38 was brought to London in 1858, by Mr. Gee, from New York, where they had arrived from Panama and Guayaquil; ten of these were purchased and sent out to Sydney, which they reached safely in November, 1858, and were from thence forwarded on to Brisbane, in Queensland; while twenty more were purchased and shipped to Melbourne, where up to the present time they have gone on excellently.

We have thus the facts presented to us of the distribution of the alpaca in the four leading Australian colonies, and we have no doubt of their increase and progress. Indeed, calculations were laid before the meeting of the ratio of increase which might be anticipated, from which it was shown that in ten years the flock of 250 would probably be increased to 3,250; and the experience of the increase of sheep in the colony was cited as an example of what could be done. In 1801 there were 6,757 sheep in New South Wales; now there are about 8,000,000. Notwithstanding the enormous draught constantly made on the flocks to supply the daily demands for food—notwithstanding that whole flocks were consigned to the boilers by their panic-stricken owners—notwithstanding disease (caused and rendered more destructive by desertion) swept away large numbers, they are not now diminished, but show a steady increase.

The supply of alpaca wool is of no small importance to a particular branch of our woollen manufacture. It is only a quarter of a century ago since it was introduced. In the first five years afterwards only about 511,000lbs. were received annually; in the last five years the imports averaged 2,600,000lbs., and that, too, at 2s. 6d. per lb., while at first it only brought 10d. per lb. In the past five years the supply has been almost stationary, and we are informed by Mr. Ledger is more likely to decrease than increase. If by the extended introduction of the animal into our colonies we can add to the supply of this valuable wool, we shall benefit materially both the colonists and our own manufacturers.

COMMON ROAD LOCOMOTIVE BILL, AND STREET RAILWAY BILL.

Our common road locomotives demand of the Legislature special statutory provision. They do so in more respects than one; for, in the first place, turnpikes, so long as they exist, have a right to toll in amount according to the injury done to the road; and in the second place, the safety of the public requires the necessary guarantee relative to speed, the construction of engine, tramways, and street-lines of railways, and the training of carriage and other horses so as to familiarize them with steam, and thus prevent shying and accident, Statute thus requires to provide for circumstances of a three-fold character.

Under the former, we have to notice the different kinds of locomotives or traction engines now on the road, and the amount of tear and wear highways sustain from them. They may be divided into four classes, viz.: Boydell's and the different kinds of endless railways with which wheels are furnished; Bray's, and the different kinds of wheels with moveable projections, teeth, or spikes on the periphery; the various kinds of fixed projections on the tire of the wheel; and plain tires of the ordinary kind, with or without clutches, together with those adapted for tramways and street railways only.

Such are the four classes of traction engines on which the Legislature proposes to levy toll. It is not for us to say what the amount of that toll should be, per ton or otherwise. Doubtless that belongs to the committee-rooms of the Commons. It is, however, no less our privilege than our duty to notice the injury done to roads; and in doing so, it does not require a vast amount of logic to prove that the tear and wear upon the highways depends more upon the manner the steam-horse is shod than upon his actual weight or tonnage. In other words, toll must be levied on steam-horses somewhat differently from what it is on our cattle.

There is evidently here a wide field for engineering inquiry in the upper committee-rooms of Parliament. To charge equal toll for Boydell's and Bray's traction engines, weights being equal, would be the highest of injustice both to the owners of the locomotives and to the trustees of highways, or those who have the charge of them. That toll should be paid on both engines is manifest. Thus far the practical question is easily solved; but when we come to the amount of tear and wear upon the road in each case, the equivalent of the toll, it is otherwise, for then we also come upon differences wide asunder, consequently requiring a corresponding difference in the amount of toll respectively levied upon each of the two kinds of engines.

In the investigation of this difference between Boydell's and Bray's wheel, that which chiefly demands attention is the comparative merits of the endless railway of the former, and the moveable projection through the tire of the latter at the point where it rests upon the ground, as regards the tear and wear the road sustains by their use in travelling and hauling trains along its surface. In this investigation several things have to be closely considered, such as the speed at which the engine travels, the wetness or character of the road, the dimensions of the endless rails of the one, and breadth and diameter of the wheel with the length of the teeth of the other, and the weight of the engine, &c.

In principle the endless rail is intended to protect the road from sustaining harm directly from the wheel, while the injury the rail itself does will depend much upon the adhesive

nature of the roads, and the manner it (the rail) is laid down. If it is laid flat down, and no indentation effected at the ends as the wheel rolls off from the one on to the other, and if it rises clean, lifting none of the road material behind, the road will sustain very little injury. A certain amount of indentation at the ends of the rails where they meet is, however, experienced, while we have often seen large lumps of clayey gravel adhere to the bottom, and rise behind with the rails. Under such circumstances the legislative maxim may be to make provision for the worst in the amount of toll.

In principle, again, there is very little difference between Bray's wheel and some of our rotary digging machines for cultivating land. The proposition of a projecting tooth or wedge entering the road where the wheel rests upon it, to make it bite, presupposes a certain amount of injury done superadded to that which a plain wheel would effect; and although, from its cycloidal action, this tooth may be said to be momentarily at rest when immediately under the wheel, yet both before and after it is otherwise, its loosening and digging action being in proportion to its length beyond the tire. Moreover, this tooth or wedge projecting across the tire where it rests upon the road, obviously makes the wheel sink deeper, and thus do more harm, than it would do were it plain, as in the fourth class; while wet clayey gravel will be more liable to adhere to it. The mechanical provision in Bray's and Romaine's wheels for withdrawing the teeth wholly or partially cannot be received as any palliation to the above objection; for if totally withdrawn, the wheel then belongs to the fourth class, or is a plain wheel; and approximately so as the teeth are partially withdrawn, the amount of damage done to the road being in accordance with the depth the biting teeth penetrate its surface—thus displacing, loosening, and breaking up the material of which it is made. In practice, Bray's wheel has thus at one time a plain tire acting on the road, and at another a toothed one; and in this case, as in the last (Boydell's) statute will doubtless have to charge toll directly as the maximum length of the teeth, but inversely as the diameter of the wheel, before justice can be done to the different interests involved.

Fixed teeth on the tire of the wheel are more destructive to roads than moveable ones, projecting lengths being equal, because they are continuously in action, digging up the road metal, in going down hill as well as when going up, while they are more liable to lift and loosen wet clayey gravel behind. The fixed projections, however, now being made on the tire hardly fall under the denomination of teeth, and must therefore be judged of according to the damage they respectively do to the road. Upon the whole, or generally speaking, they may probably be found to do less harm than the feet of horses.

With regard to plain tires, the question of toll is a comparative one between the injury done by the feet of horses and the wheels of the carts, waggons, carriages, &c., they haul, and that done by the smooth wheels of a traction engine. The feet of horses do an immense harm to roads, and for which toll is justly charged. In this respect steam has many advantages over its rival, especially in the case of the endless railway, and also in the case of the fixed tramways of stone and metal now being made; and, as we advance in the use of these means, and in the march of progress generally, there cannot be a doubt but fresh discoveries will continue to add to the ad-

vantages of steam as a motive power for general locomotion. It is for this mixed system, and this progress, that statute law has to provide, and the legislature will doubtless be guided by the comparative merits of horse and steam locomotion in framing the toll tonnage on the conveyance of agricultural produce, and other commercial goods, by the latter.

On the next division of our subject, the *weight and dimensions of common road locomotives, with the speed or rate of travelling, and length of their trains*, less requires to be said. That the crowded thoroughfare of our large towns, and that the public generally require some statutory guarantee of safety, especially at the commencement of a new system of locomotion, will readily be granted; at the same time, the Legislature will have to exercise due caution so as to avoid what may be termed *vexatious legal interference*, that can never be successfully carried out in a free country like England. And besides vexation experienced in the attempt to carry into effect impracticable statutory measures, such a course of proceeding would also have a tendency to check the progress of discovery and improvement in this most important branch of our commerce or national industry, viz., the most profitable mode of conveying goods on common roads. Under this head the legislative maxim should be to establish sound principles as the solid foundation of future practice, rather than to attempt carrying out the details of a working system, before that system has acquired a matured existence. In learning to walk and run, the child's first lesson "is the equilibrium of posture"; and as it is with the child, so is it with the steam-horse on our common roads. After he has learned "the equilibrium of posture" half the dangers to himself and the public in our crowded thoroughfares are over. Until he (the steam-horse) is thoroughly master of this, there is more danger from a short train at a slow pace than from a long train at a galloping speed, after he has fairly mastered the rudiments of his profession. We therefore repeat that, in determining statutory provision under this head no little foresight is necessary.

The safety of the public is more deeply at stake in the proper training of carriage and other horses than in the training of traction engines. There is much less danger from the latter than from the former; and as there is now an attempt being made to father the whole of the mischief being experienced upon the steam horse that is due to his rival, it will be necessary, under this head, to go somewhat more deeply into the practical details of our subject.

The steam horse, upon our common roads, is one of the most gentle, innocent, and harmless creatures imaginable. Those who have taken up a contrary credence belong to the old-wife portion of the community. It does not require logic to prove the soundness of this conclusion, the facts of the case being amply sufficient for the purpose; for the steam horse goes like clockwork along the road, right a-head, without shying, or manifesting any fear or alarm at his companions. It is his rival that shies, runs against lamp-posts, and does the harm; and, as the sequel will show, this is not to be wondered at, when we look at the manner in which he is trained. At present, in all our provinces, we are actually engaged training our young horses to shy at Traction Engines on common roads, and at locomotives on street railways; and, if we are successful, as doubtless we are in many cases, is it fair or reasonable to blame the steam horse for consequences, and to propose excluding him from our thoroughfares, in order to avoid harm? Conduct so unbecoming Englishmen can only be accounted for by an oversight of the facts of the case.

The facts of the case, then, are these: In our provinces

young horses, grazing in pastures adjoining railroads, may be seen by any traveller along the line, shying and running off on the approach of every train. As examples of this kind must be familiar to every reader of the *Mark Lane Express*, it would be superfluous to dwell upon details.

When such horses are trained by the breeders for farm-work at home, it takes a good deal of training to break them off from this bad habit. Under the management of a skilful horseman they soon become reconciled to steam, and will stand close to a railway crossing, more cool and free from agitation than the horseman himself; but under awkward trainers it is not unfrequently otherwise—animals being as much afraid of harsh treatment, or "a threshing," "hiding," or "licking" on the approach of a steam engine, as of the engine itself. With such, farmers who have any experience in the matter, as breeders and trainers of farm horses close to our railways, are familiar.

When such horses are sold for town-work, before they are broken off from shying at steam, and trained, without being so, their owners must have an imperfect conception of animal instinct if they blame such horses for shying when they first meet a traction engine in the streets of London or those of any of our other large towns.

It does not require more to be said to show that town horses must be trained not to shy at traction engines when they meet them in the streets. It must become part of the statute law, or at least common sense law of the country, that horses are not trained so long as they shy at a street railway train or traction engine. We shall not presume to dictate to our large training establishments in the metropolis how carriage and other horses are to be naturalized to steam, if we may so speak. But we may be permitted to observe that an Act of Parliament may be necessary to enable a traction engine company to provide for our large training establishments the necessary training grounds, and that there is here an open field for the profitable investment of capital in a new and most important branch of industry. If we are to have steam locomotives on common roads, street railways, &c.—as unquestionably we are—then the metropolis and every large town requires its "Traction engine training grounds" for the proper training of horses. Public safety requires this, and the Legislature should therefore make the necessary statutory provision for it, either in the Common Road Locomotive Bill or Street Railway Bill now before it, or in a separate measure.

ENGINEER.

UNPRECEDENTED PRICE OF FOUR BUSTLES AND AN OLD BONNET.—Mr. Wood, of Castlegrove,

county Donegal, has lately sold to Mr. Carr, of Stackhouse, two heifers and two six-month calves, offspring of his cow Bustle (a daughter of Bonnet, bred by Mr. R. Booth), for £1,200, the *bond fide* price, without any "luck-pennies" or "gifts again" of any kind. The old Bonnet itself, after 17 years' wear and tear, being still considered in the height of the fashion, has since been purchased by Mrs. Carr for double the price realized for her at the Killerby sale in 1852, and is now supposed to be five months in calf to War Eagle. Mr. Wood retains Bustle, though a very high price was offered by Mr. Carr for her. She is a cow of great substance, good ribs and loins, extraordinary twist, and most perfect shoulders and crops, her only fault being that her hips are a little more prominent than desirable. Mr. Wood is also still in possession of the "Norma" tribe, whose daughter, Coquette, and granddaughter, Ciboulette, now two years old, by Prince Arthur, are magnificent specimens of the shorthorn. Of grand and symmetrical proportions, and with ribs and loins seldom equalled, and impossible to be surpassed, Coquette has much of the character of Mr. Booth's Windsor prize cow, Plum Blossom. Mr. Wood has often been urged to exhibit this cow, but her tendency to lay on flesh is so great, that he has wisely abstained from endangering her breeding properties by making her up for show.

PHYSICAL GEOGRAPHY.

Compared with continental countries, the British islands, in their climate, present a remarkable contrast. Whilst in similar latitudes of the former the thermometer ranges annually from low degrees of winter cold to high degrees of summer heat, in the latter this instrument indicates a relatively medium temperature, neither descending nor ascending in its fluctuations to any extreme point. On the contrary, a medium temperature is indicated throughout the whole year. In the entire department of meteorological science, there is no subject more interesting or instructive than that which explains the cause of our climatic mediocrity; but it would palpably be out of place to enter on this now. We proceed, however, to remark further, in connection with this topic, that to the same physical agencies another important difference is due, namely, that which gives to our insular weather a prevalence of cloud, and a fitful unsteadiness unknown in countries placed in dissimilar geographical circumstances. A good English season, in the mind of the English farmer, consists, not in the absence of vicissitude, but only in the bad turns in each year being relatively less enduring than the favourable ones. Accordingly, influenced by these circumstances of incertitude, one of the most conspicuous characteristics of operative British farming centres on that flexibility in the arrangement of details which enables the husbandman to find work for his labourers in the wet or stormy day as well as in the fair one, and thereby to neutralize to himself and them the evil effects of this unsteadfastness of season.

Again, in looking back into the meteorological annals of this country, the very important fact presents itself, that in taking a tolerably extensive period of years into account, it is seen that not only do secular variations occur in point of season, but also that these changes arrange themselves, so to speak, in combined groups; inasmuch that ten, fifteen, or twenty years together will be found chronicled as continually good, and the next ten, fifteen, or twenty recorded as bad. Indeed the seemingly capricious term of nineteen years' tenure constantly inserted in the Scottish lease originated in the belief that the tenant entering under the malign influences of a then bad epoch, would be sure to reap a corresponding share of a succeeding good one before the expiration of his holding. But, whilst, as has already been remarked, no feature of English farming stands out in more prominent relief than the ingenuity displayed in accommodating the daily operations of the farm to an almost daily variation of weather, it is absolutely true that, as respects the alternate cyclical revolutions to which we have also just alluded, no thought or consideration has ever been given by our husbandmen.

Here, however, the reader may naturally exclaim

that, until the prognostics of seasons are better understood than they are at present, to vary the general yearly arrangement of the farm upon any knowledge so utterly unreliable as that of weather wisdom, would assuredly terminate in ruin and bankruptcy. Granting the proposition as thus put, let us proceed a step further in our argument; and in doing so, we shall enter, though briefly, on that very delightful branch of modern education termed "physical geography." Now, amongst the teachings of this science is revealed the important natural fact that, in like manner as every species of animal has its prescribed province of habitation on the face of the earth, inasmuch that beyond that province it will be unable either to preserve itself in health or life, or to propagate its kind, so also the self-same law of vital creation which induces this phenomenon in animal being, renders the successful transplantation impossible of any given genus of plants from its natural habitat to one materially different in soil or climate. Unless, that is, an artificial treatment be bestowed on it of a kind specially suited to the nature of the removed exotic, and of a degree commensurate with the greatness of the topographical change. Thus, for instance, we all intuitively know that somewhere the wheat plant must originally have grown into maturity and ripened its seed, and resown itself from age to age, unaided by human interference. From actual experience we also know, that in this country no such spontaneous prosperity could exist, and that, left to itself, the plant would speedily become extinct; yet cultivated with a certain amount and kind of tillage appliances, it lives, and brings forth fruit in more or less abundance. But while this is true in the tritest degree, it is no less a physical fact, although one very little reflected on, that to even the most recondite husbandry is denied the power of indefinitely extending the region of cultivation of this cereal. In every good physical atlas containing a chart descriptive of the distribution of the cultivated plants used as food, both Great Britain and Ireland are placed at the extremity of the northern province of wheat cultivation—several excellent authorities even holding the northern division of this island to be beyond the pale.

To what point has this reasoning brought us? To this: that to grow wheat, in abundant yield the English farmer has to bestow labour and incur expense in order to countervail the great disadvantages of his extreme geographical position as a wheat grower, of far greater amount than is required of his agricultural brother in continental countries. But that is not all, for while in scientific determinations such as we have been referring to, in regard to the northern boundary of remunerative wheat culture, it is enough to resort to mean or average data, it is here necessary, in giving the subject a practical application in reference to our

own climate, to hold that as long as we may be enduring one of those cyclical visitations of consecutive bad seasons, so long are we to be regarded as lying outside the boundary of profitable wheat-farming. When, indeed, the favourable years ensue in their turn, then, on the other hand, may we be said to resume our place within the pale. Of old, when the ill years prevailed, the inadequacy of yield was compensated to the farmer by enhanced prices. For, in that by-gone era of our agricultural history the husbandry of other corn-growing countries, though possessing better cereal climates, was so imperfect, and the means of shipment so limited, that habitually they had no surplus grain to part with; and when occasionally they had, there were no bottoms in which to freight it to us. But taking account, not of those by-gone circumstances, but of those at present prevailing around us, how do the latter stand? And in replying to this inquiry let us assume for a moment that the late expired season of 1860, and the alarmingly unpropitious nature of the winter-wheat seed-time of 1861, are foretastes of what may continue in annual succession as many times as did the series of bad years which began with autumn, 1799. In this case, then, the position of the English farmer will be—that, not as before will he sell his wheat at a price so enormous as fully to make up for the scantiness of yield, because, in fact, the revolutions and sanguinary wars in which the continent of Europe was the arena at the time permitted of no competition with us in our own markets; but henceforward each progressive rise of one shilling per quarter, telegraphed throughout the world, will become the signal by which countries farther and farther in the distance, and not partaking in our climatic disturbance, shall be enabled to determine the exact moment when to ship their garnered stores with the best chance of reaching England in time to meet, and perhaps to satiate, a rising market, and arrest its further upward movement.

Still, whilst all these uneasy reflections present themselves in contemplating the prospects existing in the foreground of grain farming in England, the horizon beyond exhibits nothing but brightness and hope, when we turn to reflect on the future of her pastoral husbandry. For, be it remembered that the same causes which have ever made our insular seed-times and harvests precarious, are those which, conjointly with our general fertility of soil, have imparted to English

pastures an unmatched superiority, and through their productive qualities have reared up those breeds of live stock fitted for the shambles, or the dairy, of no less unequalled preeminence. To the markets, too, of this department of agricultural produce, the home producer possesses the inestimable advantage of a quick and short transport, co-operating alike to carry the animals in unimpaired condition to their destination, and to do so at comparatively little cost. Thus, then, whilst many things are conspiring to render the growing of grain an unthriving industry in England, as many are emerging to place the native grower of animal food, whether as butcher-meat or dairy produce, in all but a position of monopoly. Cropping less and grazing more—restraining his reliance on the now precarious turnip—extending the breadth of his meadows and pastures—trusting to the sure effect of well-selected mercantile manures, to impart to inferior grass land all the productiveness of better soils—and resorting, when expedient, to supplemental supplies of artificial feeding stuffs. The judicious farmer playing this part would find himself disposing of his grazing products in an ever buoyant market, and, without jealousy, could witness the inpouring of increasing supplies of corn from abroad. And why? Because he would learn to know that the cheaper the price of bread, the greater the ability of the vast and fast multiplying body of the English population to gratify their national yearning for animal food.

Nor are the by-past statistics of English pastoral and corn farming, when placed in comparison, otherwise than unequivocally indicative of the superiority of grazing to tillage in point of remunerative results. By Caird's investigations of 1850-51, he showed that the average rental of the grazing counties was then no less than 7s. 9d. per acre better than that of the corn provinces. Again, since the date of Arthur Young's prior enquiry in 1770, the rise of rental had been 16s. 11d. per annum in the one, and only 11s. 6d. in the other. The official rentals obtained by Government from the counties of England severally, at various times since the income and property tax was first imposed, now more than fifty years ago, thoroughly support Caird's facts. We have thus a run of reliable evidence to show that the producing of animal food for the English consumer will be found a much more profitable form of husbandry than competing with foreign countries in the growth and supply of bread-stuffs.

THE GOVERNMENT AND THE HOP DUTY.

Among the innumerable incidents of taxation, few are likely to make a deeper impression than those just now occurring. The *élite* of the agriculturists of England—those who have given to Kent the character of being the garden of Great Britain—with their brethren of Sussex and Worcester—are in the very crisis and agony of their fate. The Minister refuses to see them—to hear them—to hear any one from them—

and coolly consigns them to the tender mercies of the tax-collector. The harvest was a bad one; they have nothing wherewith to raise the money to meet the tax; rent and labour must be paid; and hardly have they been put to it to pay them. When they had a plentiful harvest, foreigners came and undersold them, so that nothing remains from the very bounties of Heaven. They have met in country—in

town. Clergymen have left their sacred duties, to bear witness to their distress, and join them in their prayers—their entreaties—their supplications for a short postponement. Members of Parliament of all parties have waited in the same room for the same cause. But, no! the Minister is inexorable—"Pay," "Pay," "Pay." Men grown grey in improving their land—young couples just settled, as they fondly imagined, for life—large farmers, little farmers—all are involved in one common ruin from one common cause. Because, forsooth! WILLIAM EWART GLADSTONE imagines he can extract "blood from flint stones."

Their very virtues are used as arguments against them. "You paid before, when we granted you time; you found means to do so then, and no doubt you can do so now." Because you kept your word before—because you were ever honest to the very farthing before, we will not give you credit now! What a conclusion! What a *sequitur*! In these days of Robsons and Redpaths—of Pauls and Pullingers—of Durdans and Davidsons in commercial life, to doom to ruin the unfortunate planters of Kent and Sussex, whose probity and perseverance are everywhere acknowledged, is to revolutionize all the principles upon which the English character has been hitherto constituted.

And the tax itself—what a tax! There is, or ought to be, a philosophy of taxation. Taxes impede, and no tax therefore should be imposed which is an impediment to that which is good. Impede evil as much as you like, and get from such impediment as much as you can. For instance, tax and therefore impede gaming-houses; but to tax hops is to promote gambling. Tax and impede the growth of noxious weeds that exhaust the soil, as well as the health of those who use them; but hop land is the very perfection of cultivated soil, and produces a bitter that is most beneficial to the human constitution. Moreover, it is a raw material, and one of the constituents of the liquid food of the country. What say Adam Smith and Sir Robert Peel as to the impolicy of taxing and impeding the production of raw material? Yet William Ewart Gladstone, who professes to be a disciple of both—a free-trader *par excellence*—not only taxes this raw material, but dooms to certain and swift destruction those who produce it!

Another element of taxation is, that it should not be subjected to great and frequent fluctuation. If a Chancellor of the Exchequer cannot tell whether he will get from any particular tax a million, or a quarter of a million, or the tenth part of a million, or even less than that, how can he properly shape his "Ways and Means" to his "Estimates"? The hop duty has varied, during the last six years only, from £700,000 per annum to £70,000 per annum! Can this great trading and commercial country suffer, or run the risk of, blundering Budgets every year? Yet where is the financier who can calculate upon the returns of the hop duty? and if he cannot, how can he help blundering, or leaving to chance, or rather unseen Providence, that which ought to be as nearly as possible certain, definite, and equably productive?

Another element of taxation is, that it should not prevent the employment of labour; as the labourer, if not employed, must be fed by another and larger tax on the community. Now, the hop planter has to spend £80 per acre, and often more, in draining, planting, poles, along with rent, tithes, taxes, &c.; and it is two or three years before he gets any adequate return. The manual labour alone, of plantations in full operation, creates an expenditure of about £12 per

acre, besides the hop-picking, when hundreds of thousands of women and children are employed, who might otherwise be in the union workhouses, creating an additional taxation, from which the revenue of the State receives not one farthing.

Again, it is an important element that a tax should never do any farther injury to the tax-payer than in merely depriving him of the money which the State requires. Now, the duty on hops does incalculably more injury than this—it stops any improvement the hop-planter may be disposed to make, by vexatious restrictions upon his time and convenience. When he is disposed to commence his picking and to use his buildings, he must give 24 hours' notice of his intention to the "hop assistant." He must give a like notice of 24 hours when he intends to "bag" his produce; and should the exciseman at any time see his "frame" without a bag in it, he can compel a renewed notice, and the "bagging" must stand still till that notice be expired. He cannot take his fruit from one of his farms to another of them for the purpose of curing, without another vexatious notice. When he wishes to weigh his hops he must give notice to the "hop assistant;" and then, when they are weighed, they must remain a certain period until a superior officer arrives, who can, and often does, demand that they shall be weighed over again. These impediments create delay, and delays are proverbially dangerous to the irritated and worried planter when he finds he is too late for market. In addition to these obstructions and injuries the Sussex planter has a special and particular cause of complaint as well as the community at large. Positive fraud is promoted by the annoying accessories to the hop-tax. The name of the county is required to be placed on each "pocket" of hops before it is delivered to the factor; and as some brands are considered more valuable, or at all events more popular than others, many of the Sussex brands are picked out by the merchants, and Kent substituted. The hop-planter gets a smaller, and the hop-merchants a larger price than that to which they are severally entitled—the buyer is swindled, the grower defrauded, while the Government extracts from the low-priced and low-charactered hops just the same duty they impose upon the high. Thus, taking the average price from 1855 to 1859 of the low-charactered brands at 50s. the cwt., and the highest-charactered brands at 100s. the cwt., the poor Sussex planter is twice taxed—on the one side in the full amount of the duty, and on the other in getting a much smaller price for his produce. Is this just? Is it wise? Can it be expected to be much longer submitted to?

Another important element of taxation is that it should never place our own countrymen in a worse position than their foreign rivals. The men of Kent, with "*Invicta*" on their glorious banner, need not and do not fear any rivalry. All they ask is "a fair field and no favour." Can they have, with their brother hop-planters, such "fair field and no favour"? They cannot while this tax lasts. It stops all improvement, while the Belgians and Bavarians have no such impediments to any improvement they may devise or desire. They can dry their hops on the poles, or in large rooms; they can employ the mighty agency of steam; they can, and they do, tax our hops, as by a recent Bavarian law very emphatically appears. And yet this tax on our own producers, and on our own productions, continues to disgrace the legislation of England alone, of all the nations of the earth!

Nor is this all. There is a fixed and definite day named for the payment of the hop duties, and there are always plenty of persons ready to take advantage of the

necessary sales just before that day to meet those duties. By a species of universal conspiracy among buyers, prices are invariably run down when the inevitable hour approaches. The English hop planter finds himself taxed at both ends : first by the payment of the duty, and then by the reduction of price. The foreigner can bond, and sell when he likes ; not so the Englishman, who must pay his duty on the very day. It is true, Chancellors of the Exchequer have granted postponements—nay, more, they have encouraged and offered them. The bait has been swallowed. The planter is lured on from one precarious season to another precarious season—always to the gain of the Ministerial exchequer, very seldom to that of his own. He has to contend with the great insect family—the flea, the fly, the louse ; with “honey-dew,” “black smut,” and possibly, and too frequently, with final blight.

We wish to bring forward nothing but facts—to advance nothing but demonstrative deductions, otherwise we might point to that which other nations and other times have experienced from unjust and injudicious taxation. We might point to the taxes and the annoying and vexatious re-

strictions on the peasantry of France just before the great Revolution, which swept away throne, altar, castle, and mansion, making the whole land an Aeldama of blood—kingless, godless, lawless, and almost uninhabitable? We might point to the period in our own annals when ship money was sought to be enforced, and resisted because it was arbitrary and unconstitutional, bringing a king to the block and a dynasty shortly afterwards to perpetual exile. Happily our Sovereign can never be affected by what premiers or Parliaments can do or undo : she can neither promote nor prevent improper taxation : nevertheless let our lawgivers pause and ponder—there is such a thing as “passive resistance” to unjust and cruel taxation. Men may see their property seized and their families beggared for a little while, but a whole district cannot be sold up at once, and the time may come when “passive resistance” may spread its infectious power. And then, as it was too late for a king, who demanded ship money, to save his head, it may become too late for a British minister, who demands hop duty, to preserve his place or his prestige.

AGRICULTURAL SOCIETIES—THEIR ADVANTAGES AND ABUSES.

It is but an ungrateful business for a man to have to talk about himself. If it be in praise of his own doings, people naturally enough look on such a recommendation with some suspicion ; or if in delicate disparagement, the world may be ready enough to take him at his word, and admit it is all too true. For choice he had, perhaps, better talk to himself. Let him have every now and then inward commune as to how he is going on—what he may do to improve—how he may enlarge his sphere of action—and by what means he may do the best for himself and his family. If under his own roof, there will be no great harm should he get into the track of thinking aloud on such matters, as his wife, his children, and his servants are almost equally concerned in the subject of his cogitations. They may, indeed, put in a word or two with advantage, and the soliloquy so merge into a domestic discussion.

The case of *Paterfamilias* may have been taken as something of a prototype. At any rate, there are whole bodies who of late have devoted their proceedings to such somewhat egotistical topics. The Oxford Farmers' Club have just gone into the amalgamation of agricultural societies. Are there advantages to be gained by their continuance? and so on—the subject being introduced by Mr. Cother, of Middle Aston, who was himself first and foremost in promoting the amalgamation of the Oxford and Banbury Societies. But a few days earlier, at a meeting down in Cheshire, of the Over Agricultural Society, Mr. Dutton, of Stanthorne Hall, read a paper on “Agricultural Societies—their advantages and abuses, with some suggestions as to their improvement.” At the first-named of these gatherings, Mr. Cother concluded by proposing the following rather open-handed resolution, which was carried : “That in the opinion of this meeting the amalgamation of the societies in this and the adjoining counties for the exhibition of stock would not only tend to give additional effect to such exhibitions, but would also increase competition, be a benefit to the producer and consumer, and thereby to the whole community.” Neither the opening nor the subsequent debate offered anything very definite ; but it would seem that the union of two of the county associations has been so successful as to warrant a more

thorough identity of interests. But even this extension need not be limited to Oxfordshire. If read it aright, the discussion must be regarded as something of a “feeler” towards the establishment of that Summer Show in the Midlands, of which every now and then there is a threat.

The men of Cheshire came far more resolutely to the point, and Mr. Dutton dwelt effectively on the abuses too long associated with the conduct of these Exhibitions. Our readers will know what in our opinion has long been one of the most heinous of such offences, and it is thus that Mr. Dutton addresses himself to the same charge :—“Another abuse connected with agricultural societies is the practice of getting up animals for mere purposes of show. This has become such a monstrous abuse, that it is attracting unusual attention, and bids fair to receive an effectual check. *The Royal Agricultural Society has done much mischief in this respect*, inasmuch as it has not unfrequently awarded premiums to animals as breeding stock, which every man of common sense would say was the last thing the animal was fit for in the state it then was. Fat animals of any kind should never be allowed to compete for premiums offered for store cattle. And in exhibitions for fat stock, in my opinion no premiums ought to be given to animals so fed as to be unwholesome or wasteful as food for man.” And then the speaker proceeds to refer to the able letters of Mr. Carr “that appeared during the past year in the *Mark Lane Express*,” while he does us the honour to quote largely from our recent leading article on this gross abuse. But it is not merely to echo our own opinions or facts that we call attention to Mr. Dutton and his paper, but rather to show how far his own experience of his own local institutions may support what we have advanced. Let us cull a few of these more modern instances :—“Not a few of the bulls exhibited in the various Cheshire shows are quite unfit for breeding purposes ; many of them are kept for the mere purposes of show, and it not unfrequently happens that the successful competitor in the show-yard passes, at the close of the time for exhibition, at once to the butcher. In Cheshire we have not fallen into the monstrous plan of giving

premiums for milking cows to animals concerning which a man would be laughed at as a spoony if ever he thought that they were guilty of such a thing, except perhaps to the extent of keeping their calves for the first few weeks of their lives." And again, after quoting from Mr. Fawkes' telling protest against what has come to pass in Yorkshire, Mr. Dutton narrates how "some time ago I was in conversation with a Cheshire farmer, well known for his excellent breed of pigs, and who was at one time not only a constant exhibitor at our county show, but a very successful one, and I asked why he now never exhibited his pigs? He said that in order to win, it was so necessary to force them into extra condition that he had frequently found his best animals, both brawns and sows, so injured for breeding purposes, that he had given up showing, though he had as good if not better pigs than he ever had."

The meeting agreed pretty much with all advanced in this way. Mr. Slater "thought something ought to be done to divide the fat from the lean stock." Mr. Becket entirely concurred with Mr. Dutton, and Mr. Morton as fully "as to the appearance of fat stock in the showyards. An instance of this took place at the Great Badworth Society's Exhibition last year, where he saw a bull which was of no use to the owner for breeding purposes, and the judges threw him out altogether." A very good instance indeed is this, but unfortunately as a rule the judges do not throw them out altogether. Still, on the other side, Mr. Wild maintained, "In respect to fat cattle, if they were not useful, it was showing what they could be brought to, and there was no need of taking a lot of lean stock to exhibit in a show-yard. He should have no objection to amend their rules in respect to fat stock; but then to have premiums for a lot of lean pigs and bulls, would soon break up their show-yard altogether." Common opinion would seem to incline that a lot of *fat* pigs and bulls is tending much to the same conclusion. But let us hear all we can in this way. More than four years' since, the Haddington Farmers' Club took up this very subject of Agricultural Shows, when Mr. Douglas, the well-known breeder and exhibitor, defined the leading characteristic of improved shorthorns as "great aptitude to fatten, and early maturity, perfect symmetry (only obtained when the animal lays on beef equally), fine quality of flesh, mellowness of touch, and plenty of soft mossy hair. These points constitute the perfect shorthorn, and milking properties are only secondary considerations. If a cow can nurse respectably her own calf, that is all that ought to be required. I find in my practice that the worst milkers are the best specimens of the breed, and I uniformly set more value upon them in consequence. Another unfortunate error committed at the same [the Paris] Show was disqualifying animals on account of being too fat for breeding purposes, although the animals were proven to be regular producers. Why! it is only the best that can get fat, retain their symmetry, and continue to breed. There is no doubt about this, and such animals almost invariably breed other animals, having the same properties and characteristics as themselves." Mr. Douglas then refers to the cry of "some few" who would insist on exhibiting stock only in a lean state at a breeding show; but he characterizes such a complaint as of little value, or as "becoming more isolated." This was spoken more than four years since; while, instead of becoming more isolated, if any cry has grown it has been this wholesome protest against the contradiction and absurdity of over-feeding,

with the object of improving and extending our best breeds. We now and then hear of so sad a fate as that of the Queen of Athelstane; but, on the other hand, how many of these "cases" are hushed up? What care is taken that such failures do not get into the papers! Publish the Births and Marriages as far and wide as you please, but say nothing of the Deaths or Miscarriages. In Lady Pigot's last list is this significant paragraph, speaking of her ladyship's own cow, the Duchess of Gloucester—"Second at Ulverstone, 1859, being beaten by Captain Gunter's Moss Rose, which, though older, *had not bred*; and Lady Pigot believes she has never yet bred." The italics are so in the original.

To return to Mr. Dutton at Over, who gives good advice when telling his friends not to blame the judges, or charge them with unfairness if unsuccessful, or in any way act like "a farmer I knew some years ago, who set his mind upon winning the premium for the best bull under two years old offered by the Society, and spent a considerable sum in purchasing what was, in his opinion, a first-rate animal, and keeping it as well as possible till the day of show, when, to his extreme mortification, he found his bull not only unsuccessful, but, so far as I remember, he did not even get what a gentleman at Middlewich last year called that 'bit of rag'—*highly commended*. His rage was unbounded, and he withdrew his subscription at once." But too common a feeling, we fear, until men's minds become extended beyond the narrow limit of cock of their own walk. There was, however, one extraordinary statement in reference to the Judges, made by Mr. Ryder, the Secretary of the Manchester and Liverpool Society, that cannot be too soon corrected. He declared, speaking as it were in his official capacity, that "there were very few judges now-a-days who would come for nothing. Not only had their travelling and other expenses to be paid, but there were many of them who charged their five or six guineas for their attendance at a two-days' show. If they had fifteen judges, including £5 each for them, where was £100." This is monstrous; but we are rather inclined to think there are very few judges but who *do* come for nothing, their travelling and hotel expenses being of course paid. Not one of the judges at the Royal Society's Meetings, even with their week's work, ever receive a shilling, and Mr. Ryder in his own instance has only given us a bad precedent. The office of a judge is both a delicate and an honourable one, and the man who requires to be paid for the performance of such a duty should never again be asked to undertake it. With over-fed bulls to breed from, and paid people to judge them, we come to an accumulation of evils that may well call for another protest.

RATS.—A correspondent of the *Gardener's Monthly* says:—"I tried the effect of introducing into the entrance of their numerous holes, runs, or hiding places, small portions of chloride of lime, or bleaching powder, wrapped in calico and stuffed into the entrance holes, and thrown loose by spoonfuls into the drain from the house. This drove the rats away for a twelvemonth, when they returned to it. They were treated in the same manner, with like effect. The cure was most complete. I presume it was the chlorine gas, which did not agree with their olfactories."

CROYDON FARMERS' CLUB.

The usual monthly meeting of this Club was held at the King's Arms Inn. The chair was taken by Mr. Stenning, the president, when Mr. C. HUNT, of Mitcham, read the following paper on—

THE GROWTH AND CULTIVATION OF CLOVER.

MR. CHAIRMAN AND GENTLEMEN,—The subject I am about to address you upon this evening—viz., the Clover Plant—is so well known to all of you present—its merits as an article for sale, its nutritive qualities as fodder for your cattle, its productiveness as a crop, its highly beneficial properties as an alternative to the soil, and, above all, its sterling worth as a profitable return for a small outlay—are so generally known, that I should only be wasting your time, as well as my own, to comment upon it. My object in addressing you this evening is to endeavour to throw out for your instruction some practical hints and information, and to glean, in return, from your discussion, valuable knowledge for myself. How often do we hear farmers say, “I cannot grow clover upon my land, my soil is clover-sick; or such and such a field will not grow clover more often than once in six or seven years?” I am sure, gentlemen, you will bear me out in what I have asserted, that very often some one or other of the above-named remarks are made, and that such remarks are true is beyond a doubt, and that such a disease as clover-sickness is prevalent in soils is equally true: the disease seems generally known, and no doubt is considerably felt by many; but although such is the case, how seldom is the remedy sought for or applied! It is not so with yourselves, or with those near and dear to you. You are no sooner ill than you take steps to cure the sickness, either by consulting a doctor, or taking prescribed medicines for your disease; and yet, although some of your complaints are incurable, I have no hesitation in saying this clover-sickness, and other complaints of the soil, are easily cured by the proper application of those pills and potions which that great physician of agriculture—chemistry—has prescribed for us, and that great dispenser of medicine, Nature—has furnished us with, in the form of manures, plants, and drainage, the right and proper use of which furnish a remedy for all the ills that land is heir to; and perhaps never was the worth of these remedies made more apparent than upon the subject of my paper, the Clover Plant; and it is my intention this evening to prescribe for you a few simple remedies for the cure of its sickness, and the better cultivation of this most useful plant. Although clover is, to a great extent, an exhaustor of the soil, yet I will venture to say that of all crops grown upon a farm, there are none which enrich the soil more for after-crops; and, however strange this may appear, seeing that clover contains double as much nitrogen, three times more potash, seven times more lime and magnesia, and half as much again phosphoric acid than any of the cereals, yet it does not exhaust the soil so much, and for one simple reason—because of its close leafy nature, it so covers the soil as to prevent the evaporation of the humus from it, and the chief property contained in this humus is nitrogen, which with the cereals, and many other crops, is drawn from the soil by the sun. You will find in a dry season that the soil where your corn crops grow will be hard and dry, while on your clover-ley the ground will be moist; that moisture being caused by the leaves of the clover preventing its evaporation. Well, then, you may perhaps ask, if it so enriches the soil, how is it that we cannot grow it oftener? I answer for this reason, that where such is the case, it is because you do not crop right, or manure the succeeding crops properly. How often do I see the ruinous and absurd principle carried out of succeeding a clover-ley with winter beans, then turnips drilled amongst them in the spring, followed by wheat or oats, and either tares,

rye, turnips, or potatoes; then wheat, oats, or barley, and again clover! Perhaps, in the first instance, the clover was cut twice without being manured. The beans followed the same fate, or perhaps had a sprinkling of worn-out, dried-up dung, entirely destitute of ammonia, by its having evaporated away, and gone to benefit some other person's land when the next shower of rain comes; then the turnips were drilled between the beans; *not* was their dressing, and they were fed off without the sheep having any oilcake or hay; then came the wheat or oats, nothing for them—the sheep left plenty of dressing behind them (absurd to think of dressing after that). Again, some used-up dung for the rye, or tares, or whatever it may be next. They are fed off, or cut for greenmeat, and the turnips which follow get some more dung, or perhaps a little guano or superphosphate, and they are again fed off. Then comes the wheat, oats, or barley, and again clover, only three years and a half between the making up of the original clover-ley and sowing the ground again with it. Can any one wonder that after this treatment clover should only grow a scanty crop? The only wonder is that any grows at all, for when we come to look at the analysis of the different crops grown in succession, we then see how it is that the clover grows so bad. Here is an analysis of 500 lbs. weight of each of these plants:—

	Nitro- gen.	Phospho- ric Acid.	Potash.	Lime and Magnesia.
	10lbs....	3lbs....	10lbs....	10lbs....
Clover	10	3	6	8
Beans	9	4½	11	4
Turnips	5	2	3	2
Wheat, Oats, Bar- ley, on an av'ge	8	4	12	6
Potatoes				
Tares the same as Clover nearly.				

You will see by these figures that the most important constituents of the soil—nitrogen, phosphoric acid, and potash—have been worked upon to a great extent; and the ground not supplied with a proper equivalent in manures, or crops, the two first-named constituents, nitrogen and phosphoric acid, are the least in the soil, for in the richest soils they only bear a proportion of a 1,000th part of the soil, while in many soils they are only in the proportion of a 10,000th part; you will therefore see that the system of cropping I have named must exhaust the land, unless properly supplied with manure, and entirely divest it of those important constituents. With these facts before us, it is surprising that so many complain of not having good crops of clover, and that they cannot grow it every fourth year! But if they cannot grow it once in four years, I am sure they cannot in seven years, for the last period of that field's condition must be worse than the former. If the ground is so exhausted in four years, what must it be in seven, unless a different system is carried out, and more cereals and more manure supplied than in the previous period? Clover, like all leguminous plants, abstracts an immense deal of lime and sulphur from the soil, and this is the chief cause why its failure occurs so often. Unless there is a certain amount of those constituents in the land, you can never grow clover well. It is true the system of cropping I have before named is included with this, as that is a very important reason for its failure; but still, if a better system of farming was adhered to, you could not then grow it so often nor so well without you supply your ground with those ingredients which clover extracts so bountifully from it. In all soils there is more or less lime, but in sulphur and phosphoric acid some are wholly deficient, and where this is the case we must supply them, if we wish to properly cultivate those plants whose natures require such support for their growth. Science has revealed to us the wants and requirements of all the plants we grow, and has also furnished us with the knowledge of the food required for their sustenance and vigorous growth, and it is our fault if we do not make the proper use of such know-

ledge. I shall, therefore, at once bring before your notice the food or manures best suited for the growth of clover. The manures I have always found to be most beneficial for clover are gypsum, bone-dust, superphosphate, and guano; but the three first are, in my opinion, the best; and perhaps the most efficacious of anything is an admixture of gypsum and bones, or superphosphate, at the rate of 4 cwt. of gypsum to 2 cwt. of fine bone-dust or superphosphate, that is, if your ground is poor, or your plant thin and weak; but if your ground is good, and the clover pretty strong, then gypsum alone is sufficient, at the rate of 5 cwt. per acre. It is quite a specific (when genuine) for clover, where the soil is in any way deficient in lime or sulphur, and its effects are astonishing. In a week, if showery weather, you will see the leaves and stalks change colour, and assume a most beautiful appearance, swelling and thickening to a great extent. It should always be applied in moist and showery weather, or when the dew is on the ground, as it is then absorbed by the plant so much quicker, for it not only acts on the roots, but on the stalks and leaves. Some persons hold the opinion that when once applied it should not be used again; but this is an old-fashioned theory, and quite wrong. I use it for every crop of clover I grow, and I have never yet found any injurious effects from it; indeed, I have always found for all grasses and pulse it is a great auxiliary to their growth. You can readily understand, when you know the constitution of gypsum, why it should so act upon it. One hundred pounds of it contains 47 lbs. of sulphuric acid, 33 of lime, and 20 of water; and in 130 lbs. of clover there is contained as much as 20 lbs. of lime, besides a great deal of sulphur (this, of course, varies with the soil); and in tares, turnips, and pulses, nearly the same quantity, so that it shows how largely this plant draws upon these two substances in its growth. So, with bone-dust and superphosphate, we find a great deal of lime and phosphoric acid, which plainly shows they are adapted for this plant. In half a ton of bone-dust there are 270 lbs. of phosphoric acid, and 365 of lime, while the same weight of guano only contains 130 lbs. of phosphoric acid, and the same of lime. The ordinary run of dung, only $3\frac{1}{2}$ lbs. of phosphoric acid, and $4\frac{1}{2}$ of lime to the half ton. Superphosphate, if made from bones and vitriol, is even still better than bone-dust in those elements; for by the combination of these two ingredients, the nitrogen and phosphoric acid of the lime are instantly brought into action, and therefore by its speedy effects on the soil is of infinite value for clover. With regard to the cultivation of clover, my plan is always to follow it with a cereal; you may then follow with tares, turnips, or pulse, with safety, and follow again with a cereal; but, depend upon it, whenever clover is followed by beans and turnips, and cropped in the manner I have before stated, unless you make up to the soil artificially what is extracted, so long will your land be clover-sick, and so may you expect but scanty crops and foul clover-leys; but I have also reason to believe that a good

deal of the poor crops of clover to be seen is partly owing to the system pursued in sowing it. There are so many ways of cultivating it, both with regard to the way of sowing it, the time it is sown, and the crop it is sown on—some preferring wheat, others barley and oats. Likewise with sowing it, there are various methods adopted, such as drilling it in with the corn, sowing it broadcast, harrowing or rolling it in, and sowing it, and hoeing it when they hoe the corn. My opinion is to sow it in the month of May. The latter end of the month I prefer, as you are then safe from frosts, and sow it on by means of the seed-harrow; then hoe it in. By this means you kill two birds with one stone. You clean your corn, and well bury your seed. I believe a great deal of seed is wasted by the process of sowing it broadcast, and then rolling it in. It does not get buried, and when it germinates, it is scorched by the sun and destroyed, and particularly if the ground is hard it cannot get root. Again, with respect to drilling it in with oats, spring wheat, or barley, at the same time as the corn, if your ground should be foul, you lose the means of cleaning it by hoeing, and you thereby destroy a great deal of your clover, by smothering it with the rubbish. Neither is Lent corn so favourable a crop to grow it with, as your ground is likely to be loose, and clover likes a nice close firm soil, which in light lands is only to be obtained in the spring, and where autumn wheat has been sown. In conclusion, I would recommend all who cannot grow clover well—those whose ground is clover-sick (or, as a celebrated German chemist calls it, potash and phosphoric acid sick), to give one trial of the system I have mentioned, and to bear this in mind—never to follow clover with any crop but corn, and not to grow too many root or pulse crops between one clover-ley and another; but if they do, to use for these crops, as well as clover, a plentiful supply of those manures which will supply to the ground those elements which must naturally be abstracted. I have approached this part of the subject with some feelings of reserve and delicacy, lest from my most intimate connection with manures my motives should be misconstrued; but, however, should such be the case, I can acquit myself of any interested feelings, save my desire to benefit and instruct you. Far be it from me to recommend to your notice anything solely for pecuniary interest to myself; my sole object is to be instructive, and so long as you receive me in the kind manner in which you receive all who address you here upon any subject, so long, while I have time and health, my services will be at your command; your appreciation of them, and approval of my efforts, are the only reward I ask for; and if I obtain that, my desire is obtained. I can only regret that I have not had time to produce a better paper than I have, and done more justice to the subject; but, however, though crude the state in which it may be brought to you, I trust you will find materials on which to work, and with your skill and ability mould them into form for your interest and advantage. (Applause.)

A GRAIN OF WHEAT.

A LECTURE BY C. R. BREE, M.D., F.L.S., PHYSICIAN TO THE ESSEX AND COLCHESTER HOSPITAL.

A lecture on "The Natural History of a Grain of Wheat" was delivered before the members of the Colchester Literary Institution, on Wednesday, March 6, by Mr. C. R. Bree, M.D., F.L.S., Physician to the Essex and Colchester Hospital. In the absence of P. O. Papillon, Esq., President of the Institution, who was prevented from attending by his Parliamentary duties, the Rev. Dr. Wright, Vice-President, occupied the chair. There was a large and respectable audience.

The CHAIRMAN said he had much pleasure in introducing Dr. Bree, who was known to most of them personally, to almost all professionally and scientifically, and of late in a literary

capacity also. This was the first time that he appeared before them as a lecturer; he hoped that it would not be, by any means, the last.

Dr. BREE said, when he was asked to fulfil his duty as a member of that institution, by delivering one of its annual lectures, he was most happy to comply with the request, but he felt some difficulty in selecting a subject. He was well aware that he could not select any which could compete in attractiveness with the musical entertainments, for instance, which had recently been given to the institution; and, being himself only an amateur lecturer, he was conscious that he must

claim their indulgence. He would, however, endeavour to open to them an interesting page in the book of Nature, and would invite them to follow him while he traced the history of a member of one of the most illustrious families in the world. For surely, if they rightly applied that epithet to those among conscious beings who effected the largest amount of good, they might not improperly apply it also to a being which, though unconscious, was perhaps productive of greater benefit to mankind than any other in existence. The cereal crops, as they all knew, afforded food, in one shape or another, to almost every living human being in the world. The Esquimaux, who lived principally upon whale blubber, diversified occasionally by train oil thickened with sawdust, were perhaps almost the only race of men who did not feed upon corn of some kind or other; and they, as a race, were said to be gradually declining and decaying. If they went to the other end of the globe—to the burning plains of India, or to that strange land where the British troops had recently accomplished a great victory, and, as they all hoped, a permanent peace, they would find that the inhabitants lived almost entirely upon rice—one of the cereals. If they came into more temperate regions they would find that one or other of the many different members of this important family formed the staple food of the people. In Russia, the inhabitants subsisted chiefly upon rye; in Spain, upon maize or Indian corn; in England and other temperate regions upon wheat. These corns, there was no doubt, were created at the same time at which man himself was created. He was not saying anything extraordinary when he said this, because, as they all knew, many of the productions which they now found in their gardens and orchards had varied very considerably from their original form. If they saw, for example, the origin of their cabbage or brocoli, they would hardly recognize it—so much had cultivation changed its character, without, however, having at all altered it as a species. So likewise with wheat there had been great variation, but no essential change from its original form. There were perhaps in the world from 50 to 60 different varieties; in Europe there were 14 or 15; while of British wheat there were five or six varieties then lying on the table before him, which Mr. Francis had been kind enough to lend him, and in which they would observe, though there were, perhaps, some differences in the character of the grain, there was no tendency whatever to diverge from the general form of wheat. Of the history—the botanical history—of the wheat plant, they had no very satisfactory account. They were all aware that corn, by which, in all probability, wheat was meant, was mentioned in the Book of Genesis; and wheat was distinctly mentioned in Exodus. There could be no doubt that Egypt was the cradle of agriculture to the world, and that its inhabitants cultivated wheat very extensively; indeed some of it had come down from them to us directly in their mummies. In modern times, M. Olivier, a French botanist, had found it growing wild in Persia and on the banks of the Euphrates. So much for its history. He would now enter upon what was the more particular subject of his lecture, namely—the following out of the history of an individual grain from its cradle to its grave; and in doing so, he hoped he should be able to suggest some points which would be interesting as well as instructive. He looked upon lectures of this kind in a somewhat different light, perhaps, to many; he held that they were bound not to sacrifice the truth of science in their attempts to popularize it—that they should be careful that the instruction which they conveyed, while it was put forward in an attractive and interesting form, should not lose its character of soundness. If they did not see carefully to this, they would be doing harm instead of good. Sound science was as easy to teach as unsound, and, in his opinion, if it was studied with proper care, was a great deal more interesting. If they took up a grain of wheat, and examined it carefully, they would find at the lower part of the back a small white spot. This spot was the germ of the future plant, and if it were placed under certain circumstances it would begin to grow; that is to say, its vitality would be called into action, and

it would become a living being. What life was, it was impossible to say; its definition was beyond the sphere of human knowledge. Numerous attempts had been made to define it, but all had failed. One of the most famous definitions was that of the celebrated anatomist Beclard, who described life to be "organization in action." There was no difficulty in understanding that definition, but the little grain before him declared at once that it was not right. Because they might keep it for hundreds—probably for even thousands of years—and its vitality, though inactive, would not be extinct. Indeed, until last year, it was believed that wheat which had been found in the Egyptian mummies, where it had no doubt been lying for many thousands of years, had grown, and produced fruit; but his friend, Professor Henslow, had recently thrown some doubt upon this point, and therefore he would not press it. However, there could be no doubt that it might be kept in an inactive condition for hundreds of years, and yet be alive all the time. But though life could not be defined, it had certain properties by which it could always and easily be recognized; and this was quite sufficient for their study of organized beings. The circumstances which were necessary to excite this vitality in the case of the grain of wheat and other seeds were three:—1st, a certain amount of heat; 2nd, a certain amount of atmospheric air; 3rd, moisture. The heat by which vegetation was principally excited and supported was derived principally from the sun. But the sun, though the principal, was by no means the only, source of heat. It might surprise many of his audience to hear that the stars also were a source of heat, and a very considerable source too. M. Pouillet, a French philosopher, had calculated the radiation of heat collected from the stars, compared with that of the sun, to be in the proportion of 8 to 10, and that if they were to withdraw from the surface of the globe all the heat which was derived from the stars every living being upon the face of the earth would die. A good deal might be said about the heat which was generated within the interior of the earth. Experiments of great interest and importance were now being performed in Paris, with a view of obtaining more accurate knowledge on this matter, some account of which appeared in the *Gardeners' Chronicle* a few weeks ago. Thermometers had been sunk fifty feet into the ground, and eighty feet into a cave at Paris; and it had been found that at the former depth there was a temperature which only varied $3\frac{1}{2}^{\circ}$ from one end of the year to the other, the temperature being that of the air in which we live. At a depth of ten feet the variation was of some 15° or 20° , and so on in proportion. From these sources of heat combined there was always enough in the soil for purposes of germination. The second condition he had named was a certain amount of atmospheric air. Atmospheric air, as they knew, was composed of certain proportions of oxygen and nitrogen gas, with a much smaller proportion of carbonic acid gas. This condition was permanent and unchangeable. If they went to the top of the highest mountain, or into the deepest valley, they would find the proportion always the same—nay, more, a bottle of air which was found at Pompeii, where it had lain for 1,800 years, was found, when tested, to be exactly the same with that which is breathed by us in the present day. It was the oxygen and carbonic acid gases contained in the atmosphere which were chiefly required in the germination and growth of plants. The third condition was moisture; and if these three conditions were applied to a grain of wheat a very beautiful change took place. The chief part of the bulk of the grain, which formed the nourishment of the embryo germ, consisted of two substances—common starch, and a substance called gluten, which was nearly identical in chemical composition with the substance of beef-steak. Neither starch nor gluten were sufficiently soluble to be taken up and absorbed by the young plant. In order, therefore, that they might become available for its nourishment a chemical change took place, and they might truly say, the seed died. Chemical decomposition, which was a sign of death in any living thing, commenced in the seed; one portion of it died in order that the other might be quickened by its death. The change which thus took place was

a very beautiful one. Starch contained a little more charcoal than sugar, and the oxygen of the atmosphere which, as he had said, was one of the requisites for the germination of the seed robbed the starch of a portion of its carbon, and it became sugar, which, being easily soluble, was easily eliminated and absorbed, and became food for the embryo plant. As soon as vital action was excited by this change in the embryo the roots begin to sink into the ground, the stem to rise towards the air, and the life of the plant is fairly started. Having thus briefly sketched the process of the germination of the seed, he would refer more particularly to some of the principal points in the general organization of the plant. The roots were composed of a number of fibrous thread-like organs, from the side of each of which other branches shot out, the whole extending through the soil to a very considerable distance in search of nourishment. The end of each of these roots and rootlets consisted of a spongy body, covered with a delicate membrane, by which all fluids and the principal nourishment which the plant in its early life received must pass. They passed by what was called the law of *endosmosis*, or absorption from without, a species of capillary attraction purely mechanical in its action, by which the fluids contained in the soil, being thinner than the juices of the plant, passed in; and another current consisting of those parts of the food not required for the nourishment of the plant was established outwards. The stem, like the stems of all other plants, was formed of what were called the primitive vegetable tissues. The tissues of all plants were composed, he thought they might say entirely, of cells, because the other structures, although differing at last very much from cells, no doubt were so originally. And not only plants, but every living thing on the face of the earth was made up of vast series of cells. A vegetable cell was a little bag formed of a substance very like starch, called cellulose, and containing within it the nucleus or germ of another cell, and a nitrogenous fluid. These cells were continually forming, so that tissues of all kinds were built up from the lowest embryo to the largest oak that ever grew on earth. In addition to cells strictly so called, there was what was called woody fibre, of which the great mass of the wood in trees was formed. The next point to which he would draw attention were the leaves, which were very important indeed. The leaf was a cellular structure, its cell containing the green substance called chlorophylle. The sap was very similar in all plants, but after undergoing the process of elaboration in the cells of the leaf, and being exposed to the atmospheric air, it took innumerable different forms. The leaves were furnished with pores having lip-like edges called *stomata* for imbibing and exhaling moisture and air: they were exceedingly minute and numerous, it being estimated that every lilac leaf contained no less than 160,000. In the great majority of plants the *stomata* were on the under-surface of the leaf, but in the case of those plants which grow upon the water they were placed upon the upper surface—one of the innumerable proofs of wisdom and design of which the world was full. Of course, if in the case of water plants the usual rule had been followed, and the *stomata* had been placed on the under-surface, they could not have imbibed or exhaled, and the plant would have died. He could say a good deal, did time permit, about the food of plants. The roots imbibed a certain amount of nourishment, but not all; a great deal was received through the *stomata*, of which he had spoken, from the atmospheric air, chiefly in the form of carbonic acid gas. The soil, however, contributed the largest proportion. Soils were formed from rocks. It might be asked, "How could those hard masses of stone be changed and softened into soil?" It was done principally by the action of plants. Lichens, mosses, and other plants would take root and grow upon rocks where there was scarcely any soil; and among the excretions from all plants was vinegar, formed by the fermentation of the sugar which they contained. This vinegar acted upon the alkalies contained in the rocks, and disintegrated them; and this process going on through long periods of time to an enormous extent, and being united to the products of vegetable decomposition, produced soil. The chief constituent of soil was what was called *humus*, a kind

of vegetable carbon, and carbonic acid and water were the principal food of plants. But it was not their only food. Among the other things necessary for their nourishment and growth was flint or lime, potash or soda, iron, sulphur, phosphorus, &c. They might wonder how an insoluble substance like flint could be absorbed into the body of a plant through roots so fine that they would admit nothing which was not in a state of solution. The manner in which this wonder was effected was as follows:—A chemical change took place: the silica was converted by the action of the oxygen contained in the air into silicic acid; this united with the potash or lime which it found in the soil, and formed silicate of potash, which was soluble, and could consequently be imbibed by the plant. Were it not for this provision no plant could grow, because no plant could exist without mineral matter, as well as other kinds of nutriment: it must take up lime or flint, or some of these substances. In the case of wheat which was raised above the soil to a considerable height, the necessary strength of the stalk was given by flint—it was clothed in a flinty coat of mail. The pea, which did not support itself by its own strength, did not require so strong a stalk; and if a grain of wheat and a pea were planted together in a pot, the former would take up the flint, but the latter, which did not require it, would not. The spongioles which he had mentioned as forming the extremities of the roots, imbibed everything that was soluble; they were not endowed with a power of selection, but the ultimate cell of the plant had such a power of selecting those elements which were necessary for the nourishment and well-being of the plant, and rejecting all that was useless or hurtful. What a beautiful provision! An exception was sometimes taken, indeed, to the use of the word "beauty" in such an application as this; but to his mind it was no less appropriate with such a reference than it was when applied to the charms of form or colour, or eloquence of music. In the latter there was something sensuous mixed up with the mental emotion of pleasure; but in the former, the delight was purely intellectual, bringing us closer to the Divine creative thought, awakening the highest faculties and feelings of the soul, and in the striking language of the poet, leading us "through Nature up to Nature's God." He now came to speak of the flower of wheat. The flower of all plants, as they knew, was composed of certain organs and certain coloured or green leaves. In the case of the wheat there was no coloured flower. It consisted of two green leaves called glumes, two others called paleæ, and two small scales which were attached to the base of the ovule; it also contained a pistil, stamens, anthers, &c., like other flowers. The pollen, which was contained in the anthers, was, in fact, the embryo which, after undergoing certain changes, was to find its way into the young germ, and become the future plant. By a very beautiful provision, the pollen grain, which fell upon the feathery stigma of the wheat, was carried by a tube which sprang from the case of the pollen grain through the style to the ovule; as soon as it got there, starch and gluten were deposited around it, and it was developed into the perfect seed. He believed that his friend, Dr. Duncan, was at present engaged in investigations upon this part of the subject, the result of which would probably throw additional light upon some parts of the wonderful process which he had briefly described. (Dr. Bree illustrated this part of his lecture by a frequent reference to numerous coloured diagrams.) Such was the natural history of a grain of wheat; for when it had reached the stage to which he had now conducted it, it was given over to the farmer to be converted into bread, or to form the seed for the ensuing year, and the object of its life was accomplished. In all the stages of its history the wheat plant passed through many dangers, to some of which, known as diseases of wheat, he would, in conclusion, briefly refer. In the first place, it was attacked by various fungi, such as the well-known mildew, the red-robin or rust, the pepper brand, &c. All these were fungi which attacked and often blighted the stalks and ears of wheat. Another disease was what was commonly called cockles, which consisted of a large number of eel-like animalcules, which were generated in the ears, which they consumed and destroyed.

These animalcules possessed one very remarkable property; the black balls in which they were generated might be dried and kept for five or six years, at the end of which time, although a touch would break it to pieces, yet if they were moistened with a drop of water, the animalcules would revive and be as lively as ever. Besides the vegetable parasites already mentioned, there were a great many insect foes of wheat. There were aphides of different kinds, which sucked the juices out of the young germ, and so destroyed the plant. There was the wheat midge, which did very great mischief; it was calculated that about one-twentieth part of a crop was often destroyed by these "rogues in grain," and as much even as a third part was sometimes destroyed. The mode in which these insects lived was not very well understood. It was supposed by Kirby that they fed on the anthers of the plant, others supposed that they subsisted on the juices; they did not eat anything; but wherever they were the grain never became perfect. The microscope showed many curious points in their structure, proving their wondrous adaptation for the mode of life for which they were destined, forming of themselves a sufficient refutation of the doctrine of variation or alteration of species; for it passed all belief that any amount of change carried on for any length of time could have produced such wondrously perfect adaptation of means to an end as could be seen in these small insects. It must have resulted from forethought, and that alone. One of the most singular of these tribes of wheat-destroyers was the saw-fly, as it was called. Dr. Maclean, whom they all knew as such an excellent naturalist, had well described the interesting manner in which this little insect would cut the top part of a leaf just sufficient to allow the egg to be deposited within, and thus to be nourished by the juices of the plant, an operation which it performed by the saw-like instrument with which it was provided for the purpose, and from which it took its name. These and other parasites were continually attacking

and consuming the wheat plant, being kept in check by other parasites, which in turn attacked and fed upon them. A great deal that he had that evening said on the subject of his lecture was necessarily imperfect, for the subject was a very wide one; but he hoped that his remarks might have the effect of inducing some of the younger part of his audience especially to study the science of natural history for themselves. It abounded in every part with most interesting matter for observation and thought, and there was no better means of acquiring the art of systematising, and the power of reasoning. Ladies might study it with advantage and pleasure. Naturalists were a rather scarce genus in Colchester at present, but he hoped the rising generation would take up the science, and distinguish the town by their future researches and discoveries. He would conclude by reading a sentence upon the subject of agriculture which he thought would be interesting to the audience. It was the speech of an Indian to his tribe, and was related by a French traveller, M. Crèvecoeur. A North American Indian, a chief of the tribe of Mississieu, said, addressing his people, "Do you not see that the white man lives on corn, but we on flesh?—That the flesh requires more than 30 moons to grow, and is often scarce?—That every one of the seeds which the white man scatters on the ground returns them more than a hundredfold?—That the flesh has four legs to run away, and we have only two to catch it?—That the seeds remain and grow where the white man sows them?—That winter, which for us is a season of laborious hunts, is to them a time of rest? It is for these reasons that they have so many children, and live longer than we do. I say, then, to everyone who hears me, that before the trees above our huts shall have died of age—before the maples of the valley cease to yield us sugar—the race of the sowers of corn will have extirpated the race of flesh eaters, unless the hunters resolve to sow."

THE AGRICULTURE OF DENMARK.

By MR. MANLEY, (Her Majesty's Secretary of Legation).

Denmark being eminently an agricultural country, agriculture, in conjunction with the breeding of cattle, forms the main source of wealth to the nation.

Productions.—The principal productions of Denmark, including the Duchies of Schleswig and Holstein, are wheat, rye, barley, peas, oats, beans, buck-wheat, clover, and rape-seed.

As no return of the produce of the country has been made for some years, it is impossible to state the exact gross amount of the production at this present moment. The following table, which more especially refers to the year 1847, and which was considered a good average year, will, however, give some idea of the crops in general:—

	Barrels.	Imperial Quarters.
Wheat.....	1,350,000	or about 641,250
Rye.....	4,700,000	" 2,232,500
Barley.....	4,650,000	" 2,208,750
Peas and Beans	1,150,000	" 546,000
Oats.....	6,650,000	" 3,158,750
Buck-wheat...	600,000	" 285,000

From this table it appears that the annual crop of various kinds of grain was at that period about 20,000,000 barrels, or about 9,500,000 imperial quarters. Since that time, however, a considerable increase in the production has taken place all over the country, and it is presumed that the annual produce now is about 24,000,000 barrels (about 11,500,000 imperial quarters). Of this amount 3,250,000 barrels go for sowing, about 9,000,000 barrels for the sustenance of the population, at the rate of $3\frac{1}{4}$ barrels annually

for one person, 8,000,000 for feeding of cattle, and 3,250,000 for exportation.

The parts of the country most adapted to the cultivation of wheat are the Islands of Lolland and Langeland, part of Zealand, the March, and part of Schleswig and the eastern part of Holstein.

Hay is produced only in small quantities, near the farmers' houses, but not sufficient to meet the wants of the country.

Clover is the chief article used for feeding cattle in this country.

Turnips are cultivated in some parts of the country, but not in any quantity, and are not much used for feeding cattle, and do not enter into the system of agriculture as in England.

Potatoes are cultivated all over the country: the production about five years ago was estimated at about 2,000,000 barrels; since the potato disease, however, the cultivation of this root has much decreased.

The cultivation of rape-seed is said to be diminishing, partly on account of the high prices of corn, and partly because it is much exposed to be spoilt by worms, frost, and insects; besides, it exhausts the soil, and requires very careful treatment. According, however, to the Statistical Returns for 1857, it appears that a slight increase had taken place in that year in the exportation of that article over the preceding year. At the same time the exportation of oil-

cake had slightly diminished. Nearly the whole of this latter article is exported to England.

The cultivation of flax is also diminishing, as the proprietors no longer think it worth their while to cultivate a plant which exhausts the soil even more than rape-seed, and requires very expensive and difficult treatment.

The cultivation of hemp and hops has also slightly diminished.

On the other hand, the cultivation of all kinds of grain has considerably increased.

Seed is often brought from foreign countries—barley and wheat-seed from England and Scotland. White English wheat is much cultivated.

Usual Produce.—The usual average production per acre is, of wheat five quarters, barley or rye six quarters, and about seven quarters of oats, arising from a sowing of wheat four bushels, barley and rye from three to four bushels, and of oats six bushels.

Rotation of Crops.—The rotation of crops usually practised is as follows:—First year, fallow; second, winter-seed, wheat, rye, or rape-seed; third, barley; fourth, peas or beans; fifth, oats; sixth, clover for mowing; seventh and eighth, pasture. The arable land is generally divided into two parts, one moiety of which is employed to corn, and the other to grass and fallow.

It has been calculated that about one-half of the country, or about 300 square miles, are annually sown with corn. The total breadth of land under cultivation in the kingdom, exclusive of the Duchies of Schleswig and Holstein, in 1847, was, according to the Statistical Returns, 150 square miles; since that period, however, large tracts of heath, common and barren places, have been cultivated.

Manure.—The art of manuring is not yet perfectly understood by Danish farmers. The ordinary farm-yard manure is put on in a very disorderly manner, and consequently much is wasted. Artificial manures are but little used, partly on account of the expense, and partly because the few experiments that have been made have not proved very successful. Bones dissolved in sulphuric acid have, however, been employed in some places with satisfactory results.

Drainage.—Drainage has hitherto only been employed on the large estates, but everywhere with satisfactory results. The expense of the tubes, which are imported from England, and are subject to a heavy duty, rather prevents the progress which might otherwise be made in the art. From the West of Jutland people have been sent to England to learn the art of drainage.

Irrigation.—In most parts of the country great attention is paid to irrigation. The general method employed seems to be the so-called over-drizzling it, being the simplest and easiest. Artificial works are only found on the larger estates.

Implements.—Great amelioration has taken place within the last ten years in agricultural implements. The swing-plough is now generally used instead of the old wheel-plough; the Swedish harrow is much employed, and is much approved of, as it considerably diminishes the spring-seed labour. The Scotch harrow is also much used. Of other implements in general use, I may name the following: rollers, extirpators, heaping-ploughs, water-furrow-ploughs, subsoil ploughs, ground-shovels, &c. Thrashing-machines are now to be found everywhere. Steam thrashing-machines have, I believe, not yet been introduced into the country. Towing-machines are to be found on some of the larger estates. In the islands the American horse-rake is in great favour.

Forests.—It is calculated that the area of forests in Denmark, including the Duchies, amounts to about 480,000 Danish acres (about 600,000 English acres). The most common tree is the beech, which covers about four-fifths of the forests, and which thrives exceedingly well in this country, perhaps more so than in any other; next to the beech tree, the oak is most common. Pine and fir trees are rare, and only appear when planted; they are principally to be found in the North of Zealand and Jutland. The common fruit trees, as apple, pear, cherry, and plum trees, are found all over the country. The fruit of the peach and apricot trees does not attain its full development in the northern parts of the country, and it is only with a few exceptions, in the southern parts of the country, that these fruits are cultivated with a view to trade. Hops are cultivated in the gardens of Funen, and in some places on the south of Zealand, and in Schleswig and Holstein. A great deal of wood has been planted of late years on many of the islands.

Average Rent of Land.—The average rent of land appears to be about 9s. per English acre.

Terms of Lease.—The usual term of lease for a large farm is nine years, and on some large estates, as at Count Reventlow's, on the Island of Lolland, only seven. Besides the larger farms, there are many small holdings, for which, in some cases, rent is paid in labour, and in others in money; some of these holdings are hereditary, some life-rents, and others interminable leases.

Wages.—The average rate of wages for a farm labourer is from £4 to £4 10s. a-year, besides his food and a cottage and garden, and a certain amount of peat for fuel. Women receive from 3d. to 4d. a-day.

Cattle.—The breeding of cattle in Denmark is only next in importance to the cultivation of the soil, and in some parts, especially in Jutland, is almost superior to it, and forms, in conjunction with agriculture, the principal source of wealth to the country.

The exact number of horned cattle, including cows, bullocks, and bulls, is estimated at from 1,500,000 to 2,000,000. Of this number about 1,000,000 are cows.

The breeding of cattle is carried on more or less in most parts of the country, but most cattle are to be found in the large grazing grounds of Jutland. Some years ago, cattle-breeding began to decline, but of late has again increased on account of the high prices, owing to the opening of a direct communication with England. The average amount of exports may be estimated at about 60,000 head annually. Of this number the greater part is sent to England.

The cattle from the western part of Jutland are generally considered the best for slaughter, while the eastern part produces the best cows. Improvements in the breed have been particularly effected by animals of the Lemvig race and Ayrshire bulls. In general, on the western part of Jutland, every peasant breeds several oxen in the year, which are usually sold when three or four years old, to be fattened in the Marsh countries—Schleswig and Holstein. The average price of a bullock appears to be from £6 to £7.

It has been calculated that on an average each person in Denmark consumes about 25 lbs. of butter a-year, which, as the population is estimated at about 2,500,000, will give a total of 62,000,000 lbs. The exports of this article are about 16,000,000 lbs. annually. The greatest part is sent to England, Hamburg, Lubeck, and Norway. The average produce of a cow is from 70 lbs. to 80 lbs. of butter annually, and about 120 lbs. of cheese. The largest dairy farms are to be found in Schleswig, where from 200 to 300, and sometimes as many as 400 cows are often kept.

The principal winter food for cattle is peas, clover, vetches, oat and barley mashes, bran, and oil-cake.

Horses.—The best Danish horses are to be found in Jutland, and it is from thence that the largest exportations take place. A great many Yorkshire stallions have been imported, and have materially assisted in improving the breed. The number of horses, including colts, in the country is calculated at about 600,000. The total of exportations in 1857 was 9,768, and of importations 904.

Sheep.—The number of sheep and lambs in the country, including the Duchies, is estimated at about 1,500,000. In some parts of the country, especially in the islands, the breed has been much improved by mixture with the Dishley, Leicester, and Southdown races, by which a great amelioration has been produced both in the flesh and wool. The original Danish race of sheep, which has a coarse, short, and stiff wool, is still maintained in many places without any improvement. Fine woollen sheep are seldom kept except on some of the larger estates, as, in general, they do not thrive well in this climate. Merino sheep are kept in the South of Zealand, and on some of the other islands.

The total production of wool is estimated at 5,000,000 lbs. annually.

It is reckoned, on an average, that each sheep produces, annually, 8 lbs. of wool. The export of this article has increased of late years; but, on the other hand, the home manufacture, which is principally confined to the peasantry, has considerably decreased.

Pigs.—The total number of pigs in the country may be estimated at about 300,000. The total of exports in 1857

amounted to 43,706, and the imports to 2,506. The original Danish breed of pigs is not very good. English pigs are much in favour, and thrive well in this country, and the breed in some parts has been much improved by the importation of English boars.

Poultry.—Poultry, such as geese, ducks, turkeys, fowls, &c., are found in considerable quantities all over the country.

Bees.—Bees are kept, more or less, throughout the country.

Game.—Since the abolition of the Game Laws in 1849, game has considerably decreased in Denmark, and is now only found in any quantity on the larger estates. Wild fowl are to be found in most parts of the country, especially in Jutland, and great quantities are caught by means of decoys at Sylt, and the Island of Föhr, on the west coast of Jutland.

Fish.—The sea which surrounds the Danish Islands and the Peninsula abounds with fish, such as cod fish, flat fish, mackerel, whiting, eels, herrings, &c. The fisheries are carried on principally on the northern part of the east coast of Jutland. In many parts, especially on the coast of Schleswig and Holstein, this source of wealth is much neglected. Oyster beds are found near Hirtsholm, off the coasts of Sylt and Föhr, and in the Limfjord; and lobsters near Frederickshaven and in several other places; and salmon in the rivers in the Island of Bornholm.

There are several Agricultural Societies in Denmark, which distribute prizes for the best cattle; these prizes consist principally of implements, sheep, and pigs.

Copenhagen.

R A T S.

If every man were to write all he ever knew, saw, or heard of concerning rats, some highly amusing facts and anecdotes would be brought to light; for few indeed are the inhabitants of old houses, who have not, at some time or other, had an adventure with rats.

Detestable creatures as they are, they intrude within the walls of every building; and so acute are they in discovering the exact whereabouts of good food, that, put it where you will, they find it out. And they are so prolific that, if not kept down, they increase in numbers to such an alarming extent, that a house or building overrun with rats is about as loathsome a place as man can enter.

In my shooting excursions this season I saw a greater number of rats and rats' holes in and about the stack-yard and fields of a large farmer than I ever before witnessed on any one farm. The farmer alluded to has as fine crops "as he ever harvested in his life" (to use his own words), and, to my own knowledge, he got his corn up in splendid condition; and, as he is by no means a needy man, and wishes to keep his corn many months before selling it, the unusually strong army of rats appear almost as if sent as a curse, or to mock him. I have no hesitation in saying there are *thousands* of these vermin on his premises, and in all probability every stack on his farm is now becoming honeycombed with rats' holes, and the stacks alive with vermin. How he intends to get rid of the nuisance I know not; but

he seemed to take the matter very coolly, and to rely on the skill of his mole and rat-catcher. As may be supposed, there is very little game on his farm, and what little I have left will be driven off, unless these vermin are extirpated.

During my shooting rambles on this farm, no less than three of my wounded partridges were seized by rats within five minutes of the time they fell—though in each case I succeeded in depriving Mr. Rat of his booty. The first of these was a bird which fell in an adjoining field, and by the time I had reloaded and jumped over the fence, a rat had come out of the ditch, and was fast dragging my bird to its haunt. On another occasion a wounded bird ran and hid in a ditch, and I only discovered it through hearing a fluttering struggle, which, on peeping through the bushes, proved to be a rat with my wounded bird in its mouth. On the third occasion a bird fell dead to my shot t'other side of a thick-set fence, and as I had to walk round some fifty or sixty yards before I could get through, the bird lay on the ground several minutes, and I again saw a rat very busy about my bird, as if in the act of proceeding to drag it into the ditch, but I stopped his career with a charge of shot.

I have heard some men say rats do not attack game; but that notion is erroneous, as I have already shown. In my opinion they do as much mischief as any other vermin in the fields, and will attack young rabbits,

leverets, and partridges, whenever they can, particularly just after the fields are cleared of the corn, when their appetites become sharpened.

When I lived in the country, I knew a house, next-door to a cheesemonger's in the village, which was so infested with rats, that the maid-servants were positively afraid to go into the cellar, whether by night or day; and though traps were set and poisonous food laid for them, and five pounds paid to ratcatchers, the nuisance remained; and eventually the people left the house, for the sole reason of the rats.

In my schoolboy days, it sometimes became necessary to punish me; and on one occasion I remember thrashing one of my schoolfellows, and throwing a stinking, dead rat in his face, for some imagined grievance he had done me; when, on the circumstance becoming known to my tutor, he set me to the task of composing twenty-four lines of rhyme. I inquired upon what subject I was to write? His reply was, "Your subject, sir, will be 'The Rat;' and you will be careful to do it without any allusion to the quarrel with your school-fellow."

I had two hours allotted me, in which to perform the task. The following is an exact copy of my rhymes:

"I've a tale to relate of a fine jolly rat.
On the daintiest bits he lived and grew fat;
He'd the range of this mansion, above and below,
Though how he got entrance we never did know.
Upstairs and downstairs he roamed in the dark:
Not a room in the house but we traced his footmark.
If we had a nice relish, we wished for ourselves,
And, to keep it secure, put it high on the shelves,
His fine-smelling nose and impudent haste
Would lead him straight on, to obtain first taste.
After dinner, he always would eat Stilton cheese;
For *Dutch* would never his palate please.
The choicest of viands, the nicest of dishes—
In fact, there was nothing, however delicious,
But fell to the lot of this jolly old rat,
Which at last became so enormously fat,
That he waddled and wriggled—so they say—
In order to keep himself out of the way.
But, alas, poor brute! one morn in June,
He piped and squeaked a comical tune;
For Patty, on closing the pantry-door,
Crushed his tail, and hurt him sore:
Then, seizing a knife, she cut off his head;
And so the poor brute is dead, is dead!"

Having thus completed my task, I took the lines to my tutor, a very stern man. I watched his countenance narrowly, as he read them, and could plainly see he was amused at something, spite of his endeavours to look black.

The next day he treated me with unusual kindness, and gave me a half-day's holiday; and on the following day he made me send a copy of my verses to my father and mother, each of whom, in return, sent me half-a-crown for pocket-money, which, I need scarcely say, was the first I ever received for a literary production.

Rats have frequently been the subject of very interesting description with members of learned societies. For instance, in vol. xi. of the "Trans. Linn. Soc.," 1815, is an interesting description, with engravings, of the genus *Mus*, belonging to the section of pouched rats, by John Vaughan Thompson, Esq., F.L.S. It appears that this anomalous rat is a native of the island

of Trinidad, where it is understood not to be very uncommon, although it appears that, during the space of ten years' residence there, Mr. Thompson met with only two specimens. He describes it as of the habit and size of the common rat; the nose rather sharper; the ears naked and rounded, and of moderate size. The feet have six callous tubercles beneath, are all five-toed, the innermost toes, or thumbs, extremely short and small, the whole armed with sharp claws, those on the exterior and interior toes being small in proportion; tail about six inches long, scaly, with a few scattered setose hairs. The testicles in the male are of very large size, and prominently situated under the root of the tail. The two upper teeth are placed without the *rietus*, or opening of the mouth, which is not larger than to permit a grain of Indian corn to pass through it. The cheek-pouches are formed by a duplicature of the common integuments, open below, extending from the base of the upper teeth to the throat, and as high as the eye and ear. These cavities are lined throughout with scattered whitish hairs, and formed in the same manner as the abdominal pouch of *Didelphis*, and not at all in the way described by Buffon, of the hamster (*Mus cricetus*) and the other pouched rats hitherto discovered. The body is covered with fine lanceolate spines, declining towards the throat and belly into a coarse setose hair, and everywhere intermixed with a finer sort of hair. The whole of the upper parts of this rat are of a purple-brown colour; the lower part of the cheeks, throat, inside of the limbs, belly, and under-half of the tail are white; and the upper half of the tail is nearly black.

It appears that the habits of this remarkable rat are singular and curious. Where they are numerous, they do incalculable mischief in barns and granaries, when, not content with what they can eat on the spot, they stow away and carry off in their cheek-pouches quantities of grain, which they deposit in their retreats, for "hard times," or when food is not so easily procured.

In volume VII. of the Trans. Linn. Society 1804, is a description of a monster species of rat, a native of the East Indies, by Captain Thomas Hardwick, F.L.S. It is, however, the same species as that mentioned by Pennant in his History of Quadrupeds (third edition), vol. II., No. 377. It is also the same as that referred to by Dr. Shaw in his General Zoology, under the name *Mus Malabaricus*.*

The description in the Trans. Linn. Society is accompanied by a very good engraving, in full-sized figure, of this peculiar animal, which is the largest of the known species. It is, however, not exclusively belonging to the coast of Malabar, but is better known in natural history as *Mus giganteus*.

The weight of the rat from which the drawing was made was 2lbs. 11½ oz. Its total length 26½ inches, of which the tail measured, from root to tip, 13 inches. The specimen described was a female: the male grows to a larger size, and weighing 3lbs. and upwards.

* *Mus egriseus, auriculis rotundatis nudis, digitis plantarum exterioribus brevioribus.*—SHAW'S ZOOLOGY, Vol. II., part I. page 54.

The *Mus giganteus* is found in many places on the coast of Coromandel, in Mysore, and in several parts of Bengal between Calcutta and Hurdwar. It is partial to dry situations, and seldom found far from the habitations of man. The low caste Hindoos eat the flesh of this rat with much relish.

It is one of the most mischievous of the whole of the rat species: it burrows to a great depth, and will in this way force an entry under the foundations of granaries and storehouses. Mud or unburnt brick-walls prove no security against its intrusions: and it commonly perforates such buildings in all directions. In gardens it is equally destructive, rooting and burrowing after the seeds of all leguminous plants sown within its haunts. Cucurbitaceous plants and fruits also suffer by its depredations. And when grain and vegetables are not to be had, it will attack poultry.

The bite of this animal is dangerous: indeed Captain Hardwicke mentions an instance of hydrophobia ensuing where a European officer in the Hon. East India Company Artillery, while stationed at Futtebgur, died under a confirmed hydrophobia, in about twelve days after having been bitten by one of these rats.

The two peculiar descriptions of the species rat, I have never seen referred to in any book of natural history. To the Transactions of the Linnean Society we are indebted for many a valuable page in our Natural Histories.

Rats have sometimes been the subject of a special treatise. A work was published in the year 1768, called "The Universal Directory for taking alive and destroying rats, and all other kinds of four-footed and winged vermin, in a method hitherto unattempted; calculated for the use of the gentleman, the farmer, and the warrener; by Robert Smith, RAT-CATCHER TO THE PRINCESS AMELIA!" Thus we find that a rat-catcher was formerly a distinguished personage.

The author of the work alluded to first enters upon a long discussion on the Norway rat, which he says was originally brought from that country to England in ships trading for timber: he also states that this rat is sometimes erroneously termed the Hanover rat. He says there are few buildings either in town or country, that are not pestered with them.

We suggest that in order to discover the places where they intrude, some fine sand should be sifted about, by which means their foot-marks may be easily traced. This, as we have often heard, is an infallible method by which to betray all sorts of four-footed vermin, and indeed many a two-footed thief has been detected in the same manner.

Undoubtedly these Norway rats are very prolific, bringing forth twelve young ones at a time, and breeding three or four times in the course of a year.

The work above referred to contains excellent engravings of traps, with full and useful hints for catching these troublesome pests.

Then there is an opposition work published in the year 1783, called "The Universal Directory for taking alive, or destroying rats and mice, by a method hitherto unattempted; and calculated as well for the use of ships

and houses, as that of farmers and gardeners; by Thomas Swaine, of Greenwich, Kent, *Ratcatcher to His Majesty's Royal Navy, Victualling Offices, &c.*

In the preface, the author apologises to his readers for the high price of his little book, which he fears will "appear great beyond measure," if regard be had only to its bulk.

But the author hopes "more liberally of his purchasers;" that they will measure their pockets by its contents. He sells them "not merely a book, *but his art*;" which he promises faithfully to disclose: though he gives as a reason for thus making known the great secrets of his art, that he finds "infirmities are advancing upon him," and, as the consequence of this great disclosure will be "the certain decrease of his future employment," he presumes they will not think the price an "unreasonable compensation for the loss he is about to sustain."

He then tells us at starting, that the black rat is the old genuine house rat: no other was known in and about houses for many ages in this country. The house rat he distinguishes from the Norwegian rat, inasmuch as it lies chiefly in ceilings and wainscots in dwelling-houses, and does not, like the Norway rat, "burrow and run into shores."

Throughout his book, Mr. Swaine recommends the use of his poisonous paste, giving minute directions where to place it, all which are very well as applied to houses and out-buildings (with the usual precautionary measures); but when he recommends its being thrust into the runs of rats in *corn stacks*, pig-sties, and fowl-houses, we think the remedy worse than the disease. The original receipt for making Swaine's paste is as follows: "Take a deep glazed pan that will hold about two quarts, and put therein a pound of white arsenic in powder; pour into a tin-pot a teacupful of water, adding thereto $\frac{1}{2}$ lb. loaf sugar; place the tin pot over the fire, and stir till the sugar is dissolved and the water just boils up; then put the mixture into the pan containing the arsenic, and stir the same well. This done, add some fresh-ground wheat-meal, and knead it as stiff as possible. In absence of wheat-meal, oatmeal and flour will answer the same purpose."

Though this paste is so simply made, and the ingredients within reach, in every land, yet he hints at the expectation he entertains, that many gentlemen from the West Indies and other foreign countries will probably "please to encourage the author by sending over to him for some of his paste!" and also for some of "these books!" adding, that "they may be assured of receiving ample compensation for their trouble and expense."

A list or account is then subjoined of the number of rats he has destroyed in his Majesty's ships of war, with the names of the ships. Among the largest figures are—Prince of Wales ship, 1,015 rats killed; the Diligente, 665; the Bedford, 475; the Duke, 2,475; the Achilles, 704; the Buffalo, 705. These are selected from fifty or sixty other vessels, to the names of which figures are attached as to the rats killed aboard them. The whole aim of the author appears to be to induce people to buy

his paste and his book : the most servile suggestions are made with that view, and, as the book commences in that way, so it ends, by suggesting to landed proprietors that they should make all their tenants a present of a copy of it.

We have then another book on the subject of rat-catching, published in the year 1789, called "Directions for taking alive or destroying rats and mice, either in houses, ships, mills, farms, &c., by a method hitherto unattempted;" by John Middleton, late of Walthamstow. Printed for the author, and sold by him at Stratford Green, Essex.

This is the best of all the old treatises : there is no gammon about it. Though now long out of print, there is no modern treatise on rat-catching to be compared with it. After a well-written introduction, the author says, "One doe rat will breed about three times in a summer, and seldom bring forth less than twelve young ones at a litter. I have taken fifteen young ones from a doe rat, and have found several does with the same number."

He does not approve of poisoning rats in dwelling-houses, because, in addition to the danger incurred by laying poisoned food about where there are children, dogs, poultry, or other live tame creatures, there is the unendurable stench, for several weeks, of dead putrid rats, which lie under floors and between walls, to the disgust and annoyance of every inmate of the house. He recommends the use of the hutch trap as by far the better means of extirpating the premises of these vermin. It should be set in the following manner:—

"Set the back part of the trap close to the wall, so that the rats cannot run behind it, and about 18 inches from the hole or run, where they come in at; then tie or confine the falls of the trap so that it cannot go down; and leaving them about half up, or rather higher, so that the rats may pass under the flap with ease; then take two small bundles of clean straw, tie them up tight, and place one at each end of the trap; this prevents their having any notion that it is a trap; let the bundles of straw be about two feet long, and as big as a small wheat sheaf, setting them aslant against the wall, and before the mouth of the traps."

Never set two traps in the same quarter; by so doing you prevent their coming to either.

Never remove a trap after the rats have once taken to it, for that makes them shy.

Rats are more likely to enter freely when the traps have contracted a smell from the dung. They will seldom enter a new trap until they have been accustomed to it a few days. Hence appears the impropriety of washing the traps, as is frequently practised by some people, in order to take off the scent. A trap should never be washed.

If it be intended to hunt the rats taken alive, they must be put into a store cage; but keep them out of the hearing of those which are not caught. It is a rule with ratcatchers to look to their traps very frequently; and when the rats are very numerous, the trapper sits up all night to attend to his traps; he is then within hearing, and directly he hears a trap sprung, goes to it,

and takes out the rats, or turns them into the store-cage.

The next day you may fearlessly put your hand into the store-cage and take the rats out, one at a time, and turn them to your dogs, as they will not make the least attempt to bite when they have been kept in the cage all night; it greatly terrifies them, and particularly if they see dogs or people about them, when they always endeavour to screen and hide themselves.

There is no occasion to dress your hands with any scent or drug: such is a fallacious notion, and of no use. When you take the rats out of the cage, lift them by the tail, and turn them among the dogs.

The best time for taking rats is, the first two or three quiet hours of the night, after the good people are gone to bed.

It is always difficult to poison rats in barns, corn stacks, and granaries, because they live so well, that they will seldom be tempted to eat the poisoned bait. By far the better plan is to trap them; and where the animals are numerous the hutch-traps are the best; ten and twenty times more may be taken in these than in the iron traps, which catch only one at a time, whereas some of the others take ten or a dozen at a time.

For catching water-rats the steel traps are to be preferred; these should be set in the earth near their holes, being placed in cavities dug out so as to fit the trap exactly, and bring it level with the surface, covering it over lightly with dust or grass.

The oils used by rat-catchers for the purpose of mixing with the baits, and enticing the rats to the traps, are oil of carraway and oil of rhodium, sometimes both mixed together; rats are very fond of the scent of these oils.

Besides the works referred to, which may be termed "the black-letter books on rat-catching," there is a modern work, which for abundance of matter, anecdote, and narrative, exceeds any ever before published on the subject. I allude to a book bearing the following title—"The Rat, its history and destructive character, with numerous anecdotes; by James Rodwell (Uncle James). 1858." The author states in his introduction that his object in writing this work is for the purpose of rousing among the people one universal warfare against these enemies of mankind, "which, by their voracious habits, contribute to the impoverishing of our farmers and the privation of our fellow-creatures."

Rats feed, frolic, and fatten in the dark; they prefer night to day, and are so wary of the approach of human form, that if we enter a barn or granary where hundreds dwell, none will be seen, unless disturbed or driven from their hiding places.

Though our kitchens and cellars are nightly invaded by these pests, we rarely catch a glimpse of them, hence it is that we seldom think of them; but if they could, by any means, be made to live in open sight, on the face of the earth, every man, woman, and child would persecute them to death.

This work contains many amusing and laughable incidents connected with rats; some of them, however, are so improbable and romantic, that, although the

author is evidently an enthusiast, we cannot follow him through all the disgusting and extraordinary anecdotes he tells. There are, however, many pages of the book that are well worthy of perusal; for instance, the

"GOLDEN RULES FOR FARMERS.

"RULE 1.—If a farmer would grow rich, let him be his own rat-catcher, and never let a rat rest till he has killed it. Though it shall cost him a day's pay, it will be pounds in his pocket.

"RULE 2.—A live rat in the barn eats money; while a dead one in the dung-heap makes money. And remember this: that the death of a rat cuts off all the expenses of a worthless, hungry, multiplying family.

"RULE 3.—If a farmer would sooner raise ricks than rats, let him down with his hedges, and drive the ploughshare through the rat preserves; and, instead of rats, grow corn. If he would turn rats into gold, let him fatten the soil with their carcasses, and he shall reap a golden harvest.

"RULE 4.—The old proverb says, 'Look after the pence, and the pounds will take care themselves.' But the fourth rule says, 'Look after the rats, and the ricks will look after themselves.'

"RULE 5.—If you would go a joyous man to market, and return a rich one, build all your ricks on saddles, and give every man, woman, and boy warning that if they put anything whatever against the stacks, or under them, so as to form a ladder for the vermin—that instant they are discharged; if not, you will find one-half of your grain turned into rats, which will feed and fatten on the remainder.

"RULE 6.—By putting the above rules into practice, the careful farmer will turn his rats into guineas; while the sluggard, by laziness, will turn his guineas into rats."

THE BEST BLOOD.—THE TOUCHSTONE STRAIN.

—Mr. Earle Welby, in his article on breeding riding-horses, in the new number of *The Journal of the Royal Agricultural Society*, thus touches on the best blood for the purpose: "At the present time the Birdcatcher and Sir Hercules line is the best calculated to improve our riding horses. They all possess action, and may be known by the general airiness of their forehands and the good setting on of their necks, shoulders, and forelegs, with the drawback of a predisposition to curby hocks. Then, there is the well-known Touchstone strain; of large size, faulty in their shoulders and ankles, and remarkably powerful in their loins and hind legs; a most valuable line if judiciously crossed, combining great stoutness and speed. These are the two great lines of the present day, and which, by a careful admixture of blood, may be brought nearer to perfection than any. Among others there is the Bay Middleton line, one which has done much to diminish the general utility of horses, being an infirm, leggy, and light-middled sort. To this I may add the Melbourne and Venison lines; the former notable for handing down great size and good limbs, the other for possessing wiry but light frames. There are many other lines of descent, but the above are the most in vogue." The character of Touchstone is further confirmed by *Bell's Life in London*, in one of those able and complete "memoirs" for which that paper is so famous. Touchstone's biographer here says, "He was a horse of a nice size, with the strongest thighs, hind-legs, and quarters we ever saw. His chest was wide, his fore-ribs not particularly deep, but they went well back, and his shoulders, though considered loaded at the points, laid well. The 'heavy shoulder' characteristic, together with his round quarters, he imparted to most

of his stock, whose forte was speed, which they inherited from his sire Camel, who obtained it from his dam, a Selim mare. Touchstone himself could stay any distance. The crosses that hit best with him were the Pantaloon, Priam, Dr. Syntax, Velocipede, Whisker, Birdcatcher, Melbourne, Catton, Tramp, and Belshazzar; and the mares that bred most successfully to him were Phryne, Ghuznee, and Fair Helen, by Pantaloon; Crucifix, by Priam; Beeswing, by Dr. Syntax; Mountain Sylph, by Belshazzar; Emma, by Whisker; Decoy, by Filho da Puta; Miss Rowe, by Catton; Verbena, by Velocipede; Canezou, by Melbourne; Lady Moore Carew, by Tramp; and Vulture and Garland, by Langar. Vulture and Lady Moore Carew were half sisters, out of Kite, by Bustard, a son of Castrel, who was the sire of Pantaloon; hence the origin of this very remarkable strain of winning blood. Pantaloon was an immensely powerful short-legged horse, reminding us a good deal of both Stockwell and Rataplan, and for a long period deservedly divided the honours of the Eaton Stud with Touchstone. A more successful cross on both sides—tracing, as so many good pedigrees do, to the same horse (Selim) a few generations back—it would be impossible to discover; and we may see two happy nicks in Phryne and Fair Helen—Touchstone and Pantaloon reversed."

RURAL INDUSTRY.

BY MRS. L. H. SIGOURNEY.

"Lo! Ceres' gifts in rich profusion stand,
And smiling tempt the joyous labourer's hand."—POPE.

Work, mowers, work!
Sweep the swathe well;
How the rich clover field
Sighs where it fell;
Like a meek Christian
Yielding its breath,
Blessing its murderers
Even in death.

Work, mowers, work!
Herds and flocks that patient stand,
When stern winter robes the land,
Gathering round the farm-yard stack,
With the snow-flake on their back,
Gladdened at the heart shall be
By your kindly ministry.

Work, mowers, work!

Work, reapers, work!
Wide o'er the plain
'Neath the sharp sickle
Heap the ripe grain,
Ready and willing,
Its life-purpose one,
So dies the good man,
All his work is done.

Work, reapers, work!
Hands thus bent on rural toil,
Take no part in crime and broil,
But on households high and low
Strength and happiness bestow,
O'er the board sweet comforts spread,
Cheer the famished poor with bread.

Work, reapers, work!

Work, farmers, work!
Change the rough mould
Into the corn-sheaf,
Glittering like gold;
Into the garden roads
Healthful and fair,
Into the clustering vine
Purpling the air.

Work, farmers, work!
Better than the soldier's trade,
Slaying what his God hath made,
Crushing down in bloody strife,
Hearts all redolent with life;
Better is your art that fills
With food and joy the earth it tills.

Work, farmers, work!

FARMING ECONOMIES.

HOW TO MAKE HEAVY LAND FARMS "STOCK FARMS."

Why are they not stock farms? Certainly not because they cannot produce enough to keep stock; for if heavy lands be thoroughly drained, deeply cultivated, and heavily manured, it will produce ample crops of mangel wurzel, and other roots, clover, tares, rape, beans, and other feeding stuffs, and certainly more straw than can be grown on the lighter soils.

The real reason is, that you cannot keep stock in the open fields on such heavy land during the cold wet months.

But cannot you keep them under cover, dry and comfortably sheltered? and will it not pay you to provide sufficient shelter? I purpose in this paper to prove that it will pay, and that the absence of such covered yards on a heavy land farm is the cause of much loss and damage. I have recently been over many good farms, of from 400 to 750 acres, in Essex and Cambridgeshire, and found nothing but large open yards, with a few narrow sheds. During this wet season, the direct rain-fall, added to the water from the untroughed buildings, has caused a flooding of the yards, and a washing away of the most valuable and soluble portions of the manure, to the great injury of the farmer's pocket. This is a scarce year for straw, and farmers are now becoming converts to the cut straw and pulped root system; and yet, owing to the open yard system, they are compelled to waste a large quantity of that valuable feeding commodity, in vain attempts to keep a dry bed for their animals. One farmer told me that the flood was so great in his yard, that the men could only get across to their feeding bullocks by laying down planks; so, as a remedy, they had tied them up under the sheds, and thus saved both straw and manure. My animals and manure are all under cover; therefore, although mangel wurzel, the last wretched season, was but half a crop, and straw rather scarce, I manage by consuming the straw cut up, steamed, mixed with rape-cake, malt combs, and bran, and adding to this a very few pulped roots, and plenty of straw chaff, to keep a good head of stock remaining in condition, and making good manure, under cover.

The strong stems of bean straw are cut up, steamed, and consumed as food, the analysis showing that they are nearly equal to hay. In fact I use straw largely as food, instead of wasting it to mop up water. My short crop of roots will therefore last until June. The straw chaff is cut very fine by steam power, and absorbs the juice of the pulped roots. This is mixed with the hot steamed mess of rape-cake, malt combs, bran, and chaff, and given warm to the animals.

Simple covered yards, with space slating, may be provided at a cost of 9s. per square yard, or 1s. per superficial foot; and as I find that 12 superficial feet affords ample room for one half-bred sheep, it follows that a charge of 1s. per year per sheep would amply pay the interest on such an investment. The question then arises, whether 2 lbs. more of meat per head could be made during the six cold wet months, by placing the animals in dry comfortable quarters, as compared with their exposure to the vicissitudes of weather on a wet clay. I have long since solved the question to my own satisfaction: avoidance of death and disease would about pay for shelter; but when we add to this a great saving in the quantity of food consumed, and especially an improved quality of the manure made, it being unwashed, and unexposed to atmospheric influences,

no further argument is required in favour of such a system. The same principle holds good for bullocks. 150 superficial feet of shelter, at a cost of £7 10s., would be ample for a large bullock, at a charge of 10s. per annum for interest. When tied up, or when on sparred floors, 75 feet for a bullock, or 12 feet for a sheep, would give ample space, for the spars permit a circulation of air under and around each animal, which would not be the case with straw. If judiciously managed as to ventilation, and especially as to a properly-regulated supply of litter, your sheep will be free from foot rot, and perfectly healthy, and your bullocks equally so. Breeding animals would require rather more space than I have specified.

The time will come when the value of straw as a feeding material will be better understood, and then farmers will resort to sparred floors, or to burned clay ashes, as a bed for their animals. Mr. Randall has long adopted the latter practice with success and profit, a barrowful of dry ashes or brickdust daily being ample to keep twenty sheep dry and comfortable.

The saturated ashes form a capital turnip manure, furnishing of themselves a large supply of alkalies, &c.

Miserably unprofitable stiff clay farms, now difficult to let, would be chiefly converted into paying stock farms by an annual summer burning of 1,000 cubic yards of stiff clay or brickdust ashes to each 100 acres, at a cost of £25; for we can raise and burn at 6d. per cubic yard of ashes. The straw would be then available as food, instead of being wasted in sopping-up rain.

ESTIMATED COST FOR 100 ACRES.

	Per acre.
Burned ashes	£0 5 0
Interest at 7 per cent. on covered yards sufficient for 20 bullocks and 100 sheep	0 3 0
Interest on drainage of land per acre	0 7 0
	£0 15 0

Such an arrangement, on the part of landlord and tenant, would convert our miserable and profitless plastic clays into holdings creditable and advantageous alike to tenant, landlord, and the nation.

But then the tenant must have capital enough to purchase stock, and to buy cake for them, as well as to provide the necessary machinery for preparing the food. At present I know of several good buildings put up by landlords, whose tenants have never availed themselves of them, having neither sufficient capital nor disposition to do so.

Last year was a ruinous one to the holders of stiff, bird-lime-like, undrained clays. I know many instances where the produce has ranged from 1 to 2 qrs. per acre; and where there must have been a loss equal to one, and in many instances to more than one, rent. The difference in value of produce between the drained and undrained clays was last year very great, in fact enough to pay for several years' interest on good drainage.

J. J. MECHT.

March, 1861.

P.S.—I was speaking to a farmer, who entered upon an exhausted poor farm, without any roots, and he said, "I have 240 ewes eating cotton-seed-cake, rape-cake, and straw. My shepherd tells me that they give more milk, and of a better quality, than when, on another farm, they had plenty of turnips alone. Our 200 lambs have been lambed down with a loss of only four. Both ewes and lambs are in much better condition than when we used to feed them on turnips only, on the open fields, exposed to the vicissitudes of weather. Now they are in shedded yards, and can shelter when they choose, instead of having wet or frozen fleeces, and lying on cold wet ground, we thus avoid losses by death, and also increase the fertility of the soil by importing food on the farm."

STALLIONS FOR THE SEASON, 1861.

[NONE BUT THOROUGH-BRED HORSES ARE GIVEN IN THIS LIST].

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. Winners out by	Sire of	Standing at	Apply to	Price.
Acrobat	bay	10	by Ithuriel, out of Tour-de-Force, by Sir Hercules	by Sir started 19, won 12	won Great York S.	untried.	—	Koydon, Diss	G. Sturgeon	10 gs.
Adamas	bay	7	by Touchstone, out of Ada Mary, by Bay Middleton	started 22, won 6	ran third for the Derby	untried.	—	Theobald's, Stockwell..	M. A. Gray	8 gs.
Alarm	bay	19	by Venus, out of Southdown, by Defence	started 17, won 13	won Ascot Cup	53	Francis	Newmarket	Messrs. Barrow ..	10 gs.
Alonso	chestnut	14	by Alpheus, out of Zarina, by Monso	started 70, won 21	won Doncaster Handicap ..	untried.	—	Swadcliffe, Ranbury ..	Mr. Mulliver	8 gs., h. b. 4 gs.
Ambrase	black	12	by Touchstone, out of Amette, by Priam	started 10, won 3	won the Criterion	6	Cynricus	Burghey, Stamford... ..	Mr. J. Rose	20 gs., h. b. 5 gs.
Antinous	brown	19	by Touchstone, out of Reflecta, by Lottery	started 13, won 3	ran second for Derby	9	Apally	Hallam, Lockerton	Mr. R. Scott	10 gs., h. b. 5 gs.
Artillery	bay	6	by Bay Middleton, out of Sister to 25igs, by Defence	started 1, won 1	untried.	untried.	—	Willoughby, Broomfield	Mr. Hopkins	5 gs., h. b. 2½ gs.
Audubon	bay	8	by Touchstone, out of Jeannette, by Birdcatcher	started 21, won 7	won the Criterion	untried.	—	Lark Lodge, Curragh ..	—	6 gs., h. b. 3 gs.
Augur	bay	11	by Birdcatcher, out of Lucy Dashwood, by Sheet Anchor	started 39, won 13	won Cleveland H.	untried.	—	Craggs, Ireland	—	5 sovs., h. b. 2 sovs.
Autocrat	chestnut	12	by Birdcatcher, out of Nickname, by Lehmeel	started 4, won 3	won Chambray Stakes ..	11	Soothsayer	Beverley	Mr. Young	10 gs.
Astolfo	bay	10	by Bay Middleton, out of Empress, by Emilius	started 5, won 1	won the New Stakes	4	Lord Palmerston	Lymington	Mr. Thorn	10 gs.
Asiatic	bay	10	by Orland, out of Penary, by Emilius	started 8, won 1	won £250 at York	untried.	—	Newbold-Pacey, Warwick	J. Clarke	£1 5s.
Asiatic	brown	8	by Sweetmeat, out of fair Star, by William IV.	started 1, won 1	untried.	1	Necromancer ..	Castle Knock, Dublin ..	J. Sheehan	6 gs. (2 omars)
Backbiter	brown	16	by Gladiator or Don John, out of Scandal, by Selim	started 24, won 5	won Goodwood Stakes ..	2	Babbler	Warfield	Mr. Makin	8 gs., h. b., 4 gs.
Barbarian	bay	12	by Simoon, dam by Buzzard	started 5, won 1	ran second for the Derby ..	6	Peri colt	Urkinton, Tarporley ..	F. Lawrence	6 gs., h. b., 3 gs.
Barbatus	bay	11	by Bay Middleton, out of Barba, by Lanercost	started 12, won 2	untried.	untried.	—	Glasgow P., Doncaster ..	—	5 gs., h. b., 3 gs.
Barnton	bay	17	by Voltaire, out of Martha Lynn, by Mulatto	started 3, won 1	won the Derby	14	Fandango	Wentworth, Rotherham ..	E. Oates	10 sovs., h. b., 5 sovs.
Beadsman	brown	6	by Weatherbit, out of Mendicant, by Touchstone	started 12, won 54	untried.	untried.	—	Newmarket	Messrs. Barrow ..	20 gs. (30 mares)
Bird on the Wing, brother to	black	8	by Birdcatcher, out of Prairie Bird, by Touchstone	started 16, won 1	untried.	untried.	—	Glasgow Paddock, Doncaster	—	5 gs., h. b., 3 gs.
Bird on the Wing, brother to	black	6	by Birdcatcher, out of Prairie Bird, by Touchstone	started 14, won 8	won £530 at Newmarket ..	untried.	—	Gayton, Louth, Lincoln	Mr. B. Topham ..	10 gs.
Blackthorn	brown	6	by Buckthorn, out of Pasquande, by Camel	started 33, won 5	won Shrewsbury Handicap ..	untried.	—	Halling, Strood	Mr. J. Parr	5 gs., h. b., 3 gs.
Black Doctor, The	black	13	by The Doctor, out of Betsy Bird, by Voltaire	started 48, won 3	won Manchester Cup ..	untried.	—	Middle Park, Eitham	Mr. Benkiron	6 gs., h. b., 3 gs.
Bolingbroke	chestnut	14	by John o'Gaunt, out of Spangle, by Cresus	started 7, won 8	won Prendergast	4	Benbow	Bushy, Hampton Court ..	Mr. Ransom	7 gs., h. b., 2 gs.
Bonnie Morn	grey	9	by Chanticleer, out of Forget-me-not, by H. Poloch	started 7, won 3	won Champagne Stakes ..	untried.	—	Woodlawn, Nottingham ..	Mr. Harrison	7 gs., h. b., 3 gs.
Brocket	bay	11	by Melbourne, out of Miss Slick, by M. Poloch	started 7, won 3	won Royal Hunt Cup ..	6	Sir Hugh	Denham, Uxbridge	Mr. Wheeler	5 gs., h. b., 3 gs.
Canobie	bay	5	by Melbourne, out of Lady Lurewell, by Hornsea	started 3, won 1	won Metrop. Handicap ..	untried.	—	Cawston, Rugby	W. Hemming	12 gs., h. b., 6 gs.
Cavendish	brown	8	by Voltigeur, out of The Countess of Burling, by Touchstone	started 3, won 1	won Convivial Stakes ..	untried.	—	Boddicott, Bagby	Mr. Austin	10 gs.
Cawston	brown	7	by Melbourne, out of Countess of Albemarle, by Lanercost	never appeared ..	untried.	untried.	—	Yapham, Pocklington ..	Mr. Stilborn ..	6 gs., h. b., 2½ gs.
Cawood	bay	6	by The Cure, out of Brandy Snap, by Muley	started 11, won 1	won a Plate at Newton ..	untried.	—	Bridgend, Burton-on-Trent ..	J. Jordan	5 gs., h. b., 2 gs.
Chanticleer	grey	18	by Birdcatcher, out of Whim, by Drone	started 37, won 21	won Doncaster Cup	76	Sunbeam	Croft, Darlington	T. Winteringham ..	25 gs.
Charleston	bay	8	by Sovereign, out of Millwood, by Monarch	ran well in America ..	untried.	untried.	—	Newmarket	Messrs. Barrow ..	12 gs., h. b., 5 gs.
Claret	brown	9	by Touchstone, out of Mountain Sylph, by Belshazzar	started 27, won 8	won G. Duke Michael ..	untried.	—	Curragh of Kildare	—	6 gs.
Coltsdale	brown	18	by Lanercost, dam by Tomboy	started 32, won 8	won Liverpool Cup	1	Shafte	Stedmere, Malton	Messrs. Barrow ..	10 gs., h. b., 3 gs.
Connolly	bay	17	by Alarm, out of Dinah, by Clarion	started 25, won 3	won the Woodcote	untried.	—	Newmarket	Mr. Campbell	10 sovs., h. b., 4 sovs.
Coningsby	bay	17	by Venison, out of Ruby, by Rubens	started 6, won 3	won the Criterion	untried.	—	Ardee, Ireland	Mr. H. Campbell ..	4 sovs., h. b., £1 10s
Corobus	bay	9	by Slave, out of Galla, by Galah	started 17, won 4	won Bentinck M. S.	untried.	—	Hallford, Sunbury	Mr. H. Cawse	10 gs., h. b., 3 gs.
Costrel	chestnut	6	by The Cossack, out of Hop Duty, by Tear away	started 17, won 3	won £275 at Newmarket ..	untried.	—	Datchet, Windsor	H. Horne	5 sovs., h. b., 2 sovs.
Cotherstone	bay	21	by Touchstone, out of Emma, by Whisker ..	started 11, won 74	won the Derby	74	Glanca	Althorp, Northampton ..	T. Wilson	10 gs. (20 mares)
Cowl	bay	19	by Bay Middleton, out of Crucifix, by Priam	started 8, won 5	won Buckenham Stake ..	32	Madam Eglington	Newmarket	Messrs. Barrow ..	10 gs., h. b., 3 gs.

Cure, The	brown	20	by Physician, out of Morsel, by Mulatto	started 26, won 16	won the Claret	34	Underhand	Angel, Catterick	Mr. Ashton	25 gs. (45 mares)
Dagobert	bay	11	by Ion, dam by Langer	started 1 1/2, won 3	won R. A. S. Prize	untried.	Will End, Henley	J. Harvey	5 gs.	
Daniel O'Rourke	chestnut	12	by Birdcatcher, out of Forget-me-not, by Hea-	started 10, won 2	won the Derby	14	Slidmere, Malton	—	10 gs., h. b. 3 gs.	
Dear Me	bay	11	by Melbourne, out of Ennui, by Bay Middleton	started 45, won 7	won £130 at Goodwood	untried.	Klarikoff	Mr. Pearson	5 gs., h. b. 2 gs.	
De Clare	bay	9	by Touchstone, out of Miss Bows, by Catton	started 4, won 3	won Newmarket Stakes	2	Lady Elizabeth	Mr. Dibben	15 gs.	
De Ruiter	bay	13	by Lanercost, out of Darbelle, by Sandbeck	never appeared	—	9	Redlands, Reading	Mr. Worfolk	10 gs.	
Ditto	bay	6	by Orlando, out of Ortiz, by Melbourne	started 1 1/2, won 2	won £300 at Newmarket	untried.	Weslay by Motherwell	—	5 gs., h. b. 3 gs.	
D. O.	brown	20	by Pampey, out of La Belle, by Voltaire	started 21, won 3	won York Consolation	untried.	Beverley	Mr. Oxley	5 gs., h. b. 2 gs.	
Dr. Sangrado	brown	10	by Physician, out of Sweetbair, by Langer	never appeared	—	untried.	Thirsk, &c.	—	—	
Dr. O'Toole	chestnut	10	by Birdcatcher, out of Dahlia, by New Fashion	started 22, won 8	won £160 at Curragh	untried.	Killynon, Westmeath	—	6 sovs., h. b. 3 sovs.	
Drogheda	bay	5	by Mountain Deer, out of Juanita Perez, by	started 24, won 7	won Beresford S.	untried.	Spye, Chippendale	Mr. J. B. Starky	7 gs., h. b. 3 gs.	
Drumour	chestnut	7	by Big Jerry or Weatherbit, out of Elspeth, by	started 10, won 2	won the July	untried.	Baythorpe, Chesterfield	H. Bird	10 gs. (20 mares)	
El Hakim	bay	7	by The Cure, out of Marten Cat, by M. Moloch	started 13, won 3	won Ebor Handicap	untried.	Richmond, York	W. Metcalfe	5 gs.	
Ellington	brown	8	by The Flying Dutchman, out of Ellerdale, by	started 10, won 3	won the Derby	untried.	Willenden	Mr. C. Phillips	10 gs.	
Elston	bay	9	by Thuriel, out of Sophistry, by Voltaire	never appeared	—	untried.	Berkeley Kennels	Mr. Long	3 sovs.	
Esther	chestnut	11	by Faugh-a-Ballagh, out of Espoir, by Liverpool	started 10, won 3	won City & Suburban H.	4	Crone, Pershore	Mr. W. Hadley	40 gs.	
Fallow Buck	bay	16	by Venison, out of Planary, by Emilius	never appeared	—	11	Rawcliffe, York	—	10 gs.	
Fandango	bay	9	by Barton, out of Casanette, by Don John	started 26, won 17	won the Ascot Cup	untried.	Shedmere, Malton	—	20 gs. (25 mares)	
Father of the Turf	chestnut	21	by Muley Meloch, out of Miss Thomasia, by	never appeared	won R. A. S. Prize	untried.	Boston	Mr. P. Smith	3 gs.	
Fazello	bay	8	by Orlando, out of Canzon, by Melbourne	started 6, won 5	won 2,000 Gs. Stakes	untried.	Paddocks, Sheffield	Mr. F. Croft	15 gs. (30 mares)	
Flagellator	bay	8	by Thuriel, out of Lucy, by Epirus	never appeared	—	untried.	Pakenham, Norfolk	Mr. W. P. King	—	
Fright	bay	7	by Alarm out of Cythera, by Camel	started 41, won 6	won Handicap at Ascot	untried.	Thiebold's, Stockwell	Mr. A. Gray	5 gs.	
Gabher	bay	17	by Bay Middleton, out of Flycatcher, by Go-	started 14, won 3	won £325 at Doncaster	7	Chipping Warden	Mr. Root	5 gs., h. b. 2 gs.	
Gameboy	brown	19	by Tomboy, out of Lady Moore Carew, by Tramp	never appeared	—	37	Banbury	Mr. Groves	10 gs.	
Gamekeeper	brown	10	by Birdcatcher, out of Swallow, by Lanercost	started 53, won 10	won Chester Handicap	untried.	Maryborough, Ireland	—	2 gs.	
General Williams	bay	7	by Wormsley, out of Lady Elizabeth, by Sleight	started 15, won 4	won £183 at Manchester	untried.	Brightam, Driffield	Mr. Hudson	10 gs.	
Gemma di Verge	brown	7	by Sir Hercules, out of Snowdrop, by Heron	started 33, won 13	ran second for Ascot Cup	untried.	Manhead, Exeter	J. McKairnan	20 gs. (25 mares)	
Gibraltar	bay	24	by Muley, out of Young Sweet Pea, by Godol-	started 9, won 5	won the Port	3	Warden, Biggleswade	T. Morgan	0 gs., h. b. £2 10s.	
Glen	bay	7	by Cothstone, out of Annette, by Priam	started 11, won 5	won Stwd's Cp. Goodwood	untried.	Warden, Biggleswade	T. Morgan	7 sovs., h. b. 3 sovs.	
Glenmasson	brown	16	by Voltaire, out of The Princess, by Shane	never appeared	—	untried.	Cambridge, Duxeter	J. Ryans	10 sovs.	
Great Unknown	brown	11	by Galar, out of Pharmacopoeia, by Physician	started 22, won 4	won Northern Metropolitan	untried.	Hutton, Cranswick	J. Crompton	5 gs., h. b. 2 gs.	
Guicovar	brown	7	by Sir Hercules, out of Yard-arm by Sheet A	started 18, won 8	won Cleveland Handicap	untried.	Bushour, Wolverhampton	Mr. Daly	20 gs. (25 mares)	
Gunboat	brown	16	by Faugh-a-Ballagh, out of Athol Brosse, by	started 8, won 8	ran second for St. Leger	untried.	Spoforth, Wetherby	Mr. Groves	10 gs.	
Hadi, The	bay	6	by Jericho, out of Glee, by Touchstone	started 24, won 8	won the Criterion	untried.	Arvediston, Salisbury	Mr. W. Day	10 gs.	
Happy Land, The	chestnut	9	by Epirus, out of Fraudulent, by Venison	never appeared	—	untried.	Wardfield, Bracknell	Mr. Day	8 gs., h. b. 4 gs.	
Harry the Great	chestnut	10	by Harkaway, out of Lady Lift, by Sir Hercules	started 19, won 3	won Newmarket Handicap	untried.	Addington, Graydon	Mr. M. Walker	8 gs.	
Hercules	chestnut	13	by John O'Gaunt, out of Miss Ety, by The	started 67, won 17	won York Handicap (2)	untried.	Cholwell, Tones	Mr. Watson	8 gs.	
Hungerford	chestnut	12	by Pantaloon, out of Plenary, by Emilius	started 14, won 5	won Glasgow Stakes	6	Newmarket	Mr. Butler	10 gs.	
Hesperus	bay	12	by Pantaloon, out of Phryne, by Touchstone	started 14, won 5	won New Stakes	5	Merryman	Mr. Benkiron	16 gs.	
Hobbie Noble	chestnut	10	by Hetman Platoff, out of Infidelity, by Voltair	started 36, won 14	won £240 at York	2	Gillingwold, Richmond	Mr. Simpson	6 gs., h. b. 3 gs.	
Hosodar	chestnut	11	by Birdcatcher, out of Wasp, by Muley Meloch	never appeared	—	2	Minion, Wem	Mr. Clay	7 sovs., h. b. 3 sovs.	
Harworth	chestnut	16	by Harkaway, out of Idle, by Sir Hercules	started 9	—	16	Swalecliffe, Banbury	Mr. Gulliver	15 gs.	
Idle Boy	chestnut	4	by the Flying Dutchman, out of Urania, by Idle	started 5	—	untried.	Essexington, Thame	Mr. Shrumston	10 gs., h. b. 8 gs.	
Idler	brown	30	by Velocipede, out of Cyprian, by Partizan	started 6, won 3	won Great York Stakes	16	Noisy	—	3 gs.	
Joe Lovell	bay	13	by Tearaway, out of Madoc Ardagh, by Napoleon	started 31, won 1	won Liverpool Leger	untried.	Moynath, Trim, Ireland	—	4 sovs., h. b. 2 sovs.	
Johnstown	bay	6	by Jericho, out of Guadracs, by Sheet Anchor	started 11, won 1	won Liverpool Leger	untried.	Rawcliffe, York	—	5 gs.; winners, and dams of, gratis	

STALLIONS FOR THE SEASON 1861—(Continued).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of Winners out by	Sire of	Standing at	Apply to	Price.
King Caradoc...	black ..	13	by Prince Caradoc, out of Miss Julia Bennett by Muley Moloch	started 14, won 2	won £144 at Malton....	untried.	—	Scarbo'	Mr. Stephenson ..	<i>gratis</i> h. b. 2 gs.
King of Trumps chestnut	chestnut	12	by Velocipede, out of Mrs. Gill, by Viasor ..	started 47, won 15	won the Port	1	Doefoot	Root, Clithero	R. Heseltine.....	15 gs.
King Tom	bay	10	by Harkaway, out of Pocahontas, by Glencoe ..	started 6, won 9	ran second for Derby ..	6	Mainstone	Mentmore, Bucks	C. Markham	10 gs.
Knight of Arvenl chestnut	chestnut	14	by The Doctor, out of Blue Bonnet, by Touchstone	started 6, won 4	won the Port	13	Fitman	Agglathorpe, Middleham	Mr. T. Dawson.....	10 gs., h. b. 5 gs.
Knight of Khars bay	bay	6	by Nutwith, out of Pocahontas, by Glencoe ..	started 10, won 2	won Whitley Stakes.....	untried.	Black Swan ...	Stanton, Shifnal	Mr. Eyke	10 gs.
Knight of the Whistle	chestnut	23	by Velocipede, dam by Whisker.....	started 22, won 12	won Royal Hunt Cup ..	9	—	Mountainstown	—	5 sovs., h. b. 2 sovs.
Koh-i-noor	chestnut	12	by The Libel, out of Miss Kitty Cockle, by Cadland	started 17, won 4	won Cheshire Stakes ..	untried.	—	Wolverhampton	Mr. Daly	6 gs., h. b. 3 gs.
Lambton	bay	11	by The Cure, out of Elphine, by Emilius.....	started 25, won 10	won York County Plate..	—	—	Ormsby, Bigg	Mr. J. Ashton	10 gs.
Lambourn	chestnut	7	by Loup-Garou, out of Slater to Satirist, by Pantaloon	started 17, won 5	won the Molecomb	untried.	—	Warford, Knutsford ..	Mr. Makin.....	8 gs., winners 4 gs.
Lance	bay	8	by Lancelot, out of Harriet Cawthorne, by Camel or Slashing Harry	started 23, won 12	won Portland Plate ..	untried.	—	Rawcliffe, York	The Manager.....	5 gs., h. b. 2 1/2 gs.
Lancelot	brown..	24	by Camel, out of Banier, by Master Henry.....	started 10, won 6	won St. Leger	25	Lance	Paddocks, Sheffield ..	Mr. Croft	5 gs.
Leamington	brown..	8	by Faugh-a-Ballagh, dam by Pantaloon.....	started 25, won 2	won Chester Cup (2) ..	untried.	—	Rawcliffe, York	Messrs. Weatherly ..	15 gs.
Little David	bay	11	by Slane, out of Olla, by Mus	started 15, won 7	won Cambridgehire ..	untried.	—	Blackheath	G. Harding	20 gs.
Longbow	bay	14	by Ibrhel, out of Miss Bowe, by Catton	started 21, won 13	won Stewards' Cup	16	Toxophilite	Knowsley, Prescott ..	T. Forslaw	15 sovs.
Lord Falconberg bay	bay	11	by Birdcatcher, out of Alice Hawthorne, by Muley Moloch	started 19, won 1	won a Royal Plate.....	1	First Lord	Spofforth, Weatherly ..	Mr. Groves	15 gs.
Lord Albemarle	bay	11	by the Emperor, out of Coral, by Sir Hercules	started 23, won 5	won 85 at Goodwood ..	untried.	—	Jockey Hall, Curragh ..	Mr. Brennan.....	5 sovs., h. b. 2 sovs.
Lord of the Isles	bay	9	by Touchstone, out of Fair Helen, by Pantaloon	started 10, won 4	won 2,000 gs. Stakes ..	1	Dundee	Swalcliffe, Banbury ..	Mr. Gulliver	25 gs. (40 mares)
Loup-Garou	black ..	15	by Lanercost, out of Moonbeam, by Tomboy ..	started 6, won 1	received £15 ft.	13	Lupellus	Redlands, Reading	Mr. J. Dibbin	15 gs.
Loyola	black ..	7	by Surplice, out of Latitude, by Langar	started 10, won 2	won the Clearwell	untried.	—	Aldworth, Northblech..	Mr. Waite	10 gs.
Malacca	bay	8	by Ratan, out of Alice, by Touchstone	started 22, won 5	won Cambridgehire ..	untried.	—	Willoughby Broomfield ..	Mr. Hopkins	5 gs., h. b. 2 gs.
Marionette. The	brown..	5	by Touchstone, out of Marion, by St. Martin ..	started 5	ran second for the Derby ..	untried.	—	Warfield, Backnel	Mr. E. Day	12 gs.
Marquis, The	chestnut	13	by Birdcatcher, out of Ellen, by Birdcatcher or Apollo	started 36, won 13	won the Angelsea	3	Princess Royal..	Skreen, Ireland	—	5 gs., h. b. 2 gs.
Marys	chestnut	10	by Orlando, out of Malibran, by Whisker	started 7, won 3	won July Stakes	untried.	—	Middle Park, Eltham	Mr. Blenkiron	10 h. b. 5 gs.
Masaniello	chestnut	6	by The Hero, out of Ignorance, by The Little Known	started 1	—	untried.	—	Manhead, Exeter	J. McKarnan	5 gs.
Marley Hill	brown..	10	by Melmoure, out of Mowerna, by Touchstone	started 4, won 1	won North Derby	untried.	—	Sherborne, Driffield	Mr. Stockdale	5 gs., h. b. 2 gs.
Mayor of Hull	chestnut	11	by Shawn Buidhee, out of Zulima, by Philip ..	started 1	—	untried.	—	Theobold's Enfield	Mr. A. Gray	6 gs., h. b. 3 gs.
M	brown..	7	by The Cure, out of Theano, by Waverley ..	started 11, won 3	won the Nursery	untried.	—	Mountainstown, Meath ..	—	15 gs.
M	chestnut	13	by Belrain, out of Menopo, by Voltaire	started 25, won 9	won Newmarket St. Leger ..	2	Pactolus	Burgilley, Stamford ..	Mr. H. Rose	15 gs.
Middex	brown..	10	by Melbourne, out of Evening Star, by Touchstone	started 6	2nd for 2,000 l.s. Stakes ..	1	Temple Bar	Hasketon, Woodbridge ..	Mr. Walsh	5 gs., h. b. 2 1/2 gs.
Midway	chestnut	14	by Slane, out of Semiseria, by Voltaire	started 21, won 10	won Ascot Vase	9	High Treason...	Richmond, York	Mr. R. Wright	12 gs.
Minnet	bay	—	an Arabian	—	ran well in India	untried.	—	Halleaths, Lockerbie	Mr. R. Scott	2 gs.
Mohead Mirza	bay	—	an Arabian	—	—	untried.	—	Newmarket	Messrs. Barrow..	3 sovs. (30 mares)
Monarch	bay	10	by The Baron, Sing, or the Emperor, out of France, won 23	ran in England & France, won 23	won a Plate	untried.	—	Dangu, Gisors, France ..	—	20 sovs.
Moorecock	brown..	19	by Heron, dam by Young Phanton	started 8, won 4	won the Criterion	11	Druid	Berkeley	Mr. J. Carey	7 gs., h. b. 3 gs.
Mountain Deer..	bay	13	by Touchstone, out of Mountain Sylph, by Belshazzar	started 20, won 6	won the Great Yorkshire ..	untried.	—	Dean's Hill, Stafford ..	Mr. Painter	15 gs. (40 mares)
Mr. Milner	brown..	15	by Bay Middleton, out of Miss Milner, by Malek	started 2, won 1	won the Molecombe	—	—	Newmarket	Mr. Tweed	10 gs., h. b. 3 gs.
Musjid	brown..	3	by Velmuster, out of Peggy, by Muley Moloch	started 8, won 1	won the Derby	untried.	—	Leysburne, Maidstone ..	Mr. G. Holmes	7 gs., h. b. 2 gs.
Napoleon	brown..	5	by Volteiger, out of Royalty, by Bay Middleton	started 6, won 1	won Northumberland P. ..	untried.	—	Toll Gavel, Beverley	Mr. G. Holmes	10 gs., h. b. 3 gs.
Neatham	bay	13	by Hetman Flat, out of Wasp, by Muley Moloch	started 10, won 8	winner of the best Anglo-Indian prizes	7	Narcissus	Middle Park, Eltham	Mr. G. Holmes	10 gs., h. b. 3 gs.
Nero	sl. grey	—	a Bedouin Arabian	—	—	untried.	—	Toll Gavel, Beverley ..	Mr. G. Holmes	7 gs., h. b. 3 gs.

Neville	bay	10	by Napier, out of Sally Snobs, by Sandbeck.....	started 16, won	7	won Gt. Northern Hand.	untried.	—	Richmond, Yorkshire..	W. Metcalfe	7 gs.; winners and dams of, <i>gratis</i> .
Newminster	bay	13	by Touchstone, out of Beeswing, by Dr. Syntax.....	started 10, won	2	won St. Leger	untried.	—	Rawcliffe, York	Messrs. Wetherby ..	50 gs.
Newton-le-Wil- lows	brown ..	7	by Melbourne, out of Lapwing, by Bustard.....	started 19, won	8	won Sirwan Handicap.....	untried.	—	French Park, Ireland....	—	5 sovs., h. b. 2 gs.
North Lincoln ..	bay	5	by Priades, out of Cherokee, by Redshank	started 31, won	17	won the Criterion	untried.	—	Mentmore, Bucks	C. Markham	10 gs.
Nutbourne	chestnut	4	by Nabob, out of The Princess, by Merry Monarch ..	started 13, won	2	won the Finton	untried.	—	Nubourne, Ensworth ..	Mr. Wyatt	22 gs. (30 mares)
Nutpecker	brown ..	11	by Nutwith, out of Amina, by Sulian	started 19, won	6	won Drawing Room Stks.	untried.	—	Yorkshire Grey, ...	—	20 gs., h. b. 3 gs.
Nutwith	bay	21	by Tomboy, dam by Copus.....	started 7, won	3	won St. Leger	34	Coburn	Barnsley, Stamford ...	Mr. H. Rose	15 gs.
Old Fashion (late Old Tom)	bay	7	by Melbourne, out of Lady Shrewsbury, by	started 35, won	8	won £120 at Newmarket....	untried.	—	Brownston, Curragh....	—	5 sovs., h. b. £2 10s.
Onar Pasha	bay	9	an Arabian—a pure Seglarie Dideruee	never appeared	—	—	untried.	—	Althorp, ...	Mr. Wilson	2 gs.
Oulton	bay	9	by Melbourne, out of Alice Hawthorn, by	by started 11, won	7	won Queen's Vase.....	2	Rasley	Hastcon, Woodbridge ..	R. Welsh	10 gs.
Paletot	brown ..	9	by Touchstone, out of Canzou, by Melbourne.....	started 18, won	4	won £1800 at Newmarket ..	untried.	—	Knowler, Prescott	T. Poshaw	7 gs., h. b. 3½ gs.
Pelion	brown ..	11	by Ion, out of Ma. Pasha, by Jerry	started 16, won	9	won Eclinton Stakes.....	6	Cynie	Danebury, Stockbridge..	Mr. Huchell	10 gs.
Peppermint	brown ..	12	by Sweetmeat, out of Pantaloon, by	started 24, won	2	won £200 at Newmarket ..	untried.	—	Uxington, Turfway	Mr. Knight	3 gs., h. b. £1 10s.
Petruchio	chestnut	21	by Orlando, out of Virago, by Peribius the First ..	started 24, won	1	won match at Newmarket ..	untried.	—	Crone, Pershore	Mr. W. Hadley	5 gs., h. b. 2½ sovs.
Phegion	bay	21	by Bartram, out of Lucca, by Reveller	started 6, won	2	won G. Duke Michael S.	13	Leopold	Burgley, Stamford ...	Mr. H. Rose	10 gs., h. b. 2½ sovs.
Plaret	bay	17	by Sweetmeat, out of Phegion, by Emilius	started 9, won	4	won the Molecomb	untried.	—	Ash Hill, Kilmallock....	—	5 sovs., h. b. 3 sovs.
Plum Pudding ..	brown ..	4	by Sweetmeat, out of Fioranella, by Bidcatcher ..	started 5, won	4	won the Molecomb	untried.	—	Leggan, Bellewstown..	—	5 gs., h. b. 2 gs.
Plumstone	chestnut	3	by Sugar Plum, out of Molly-from-Tim, by	never appeared	—	—	untried.	—	Moynath, Trim	—	4 sovs., 2 sovs.
Pompey	bay	21	by Emilius, out of Variation, by Bustard	started 26, won	10	won Great York Handicap (2)	18	Nancy	Warfield, Berks	Mr. Day	5 gs.
Pottinger	bay	17	by Plenipotentiary, out of Enterprize, by De- fence	started 22 won	5	won £80 at Newmarket ..	untried.	—	Spaldington, Howden..	Mr. Sanderson ..	5 gs., h. b. 2 gs.
Prime Minister ..	brown ..	13	by Melbourne, out of Pantaloon, by Pantaloon ..	started 31, won	8	won the Port	untried.	—	Childwick, St. Albans ..	W. Brown	10 gs., h. b. 5 gs.
Rangoon	chestnut	11	by Pantaloon, out of Languish, by Cain	started 1, won	—	—	untried.	—	Ardee, Ireland	C. Campbell	5 sovs., h. b. 2 gs.
Ratapan	chestnut	11	by The Baron, out of Pocahontas, by Glencoe ..	started 71, won	42	won 21 Royal Plates	7	Kettledrum	Tickhill Castle Farm ..	W. Hornshaw ..	25 gs. (40 mares)
Rattle	chestnut	11	by The Fallow Buck, out of The Hauble, by ..	started 7, won	—	—	untried.	—	Audler's Ash, Liss	Mr. Ayling	8 gs.
Retriever	chestnut	95	by Recovery, out of Taglion, by Whisker	started 53, won	24	won Goodwood Stakes....	11	Remunerator	Water Tower, Rugby ...	Walker & Watson ..	5 gs., h. b. 2½ gs.
Revenge	chestnut	18	by Recovery, dam by Hampton	carried a huntsman	—	won hunter premiums ..	untried.	—	Cowbridge, Glamorgan ..	Mr. Peat	5 gs., h. b. 3 gs.
Rinaldo	bay	5	by Kingston, out of Kirtle, by Sulian	started 3, won	—	—	untried.	—	Churchend, Wilsden....	Walker & Watson ..	5 gs., h. b. 2½ gs.
Rochester	black ..	15	by Chatham, out of Margravine, by Little John ..	started 17, won	5	won £275 at Newmarket ..	9	Cowley	Water Tower, Rugby ...	—	4 sovs., 2 sovs.
Reebuck	brown ..	4	by Mountain Deer, out of Marchioness D'Eu ..	started 2, won	—	—	untried.	—	Balintubber, Ireland ..	—	8 gs., h. b. 3 gs.
Roland	brown ..	15	by The Saddler, out of Executrix, by Liverpool ..	started 15 won	2	won 9 Premiums	1	Jane	Saham Watton	Mr. Costendieck ..	5 gs., h. b. 3 gs.
Roule	bay	5	by The Cossack, out of Dividend, by Auckland ..	started 3, won	1	won Ascot Stakes.....	untried.	—	Welford, Ollerton	—	5 gs., h. b. 3 gs.
Ruby	bay	10	by Bay Middleton, out of Crown Jewel, by Dul- cimer or Coronation ..	started 9, won	1	won Althorp Park S.	untried.	—	High Wycombe	Mr. T. Robinson..	5 gs., h. b. 2½ gs.
Russborough ...	chestnut	14	by Tearayay, out of Cruiskeen, by Sir Her- cules	started 25 won	4	ran a dead heat for St. Leger	1	Willy Reilly	Agglethorpe, Middleham	Mr. T. Dawson ..	10 gs.
Sampson	black ..	6	by Goliah, out of Lady Sarah, by Velocipede ..	started 11, won	3	won £100	untried.	—	Church End, Wilsden....	Mr. Peat	5 gs., h. b. 3 gs.
Saunter	black ..	7	by Irish Birdcatcher, out of Ennui, by Bay ..	started 54, won	26	won Goodwood Cup.....	untried.	—	Croft, Darlington	Mr. Winteringham	15 gs.
Schuloff	bay	5	by The Cossack, out of Mabella, by Melbourne ..	started 2, won	1	won Tyro Stakes	untried.	—	Montbarrow, Ulverston	R. Batty	10 gs.
Seabury	bay	6	by The Cure or Sweetmeat, out of Themis, by ..	started 24, won	9	won the Queen's Vase ..	untried.	—	Downham, Brandon ..	—	8 gs., h. b. 4 gs.
Sir Collin	chestnut	7	by Robert de Gorham, out of Delaine, by Bay ..	started 35, won	12	won Epsom Cup	untried.	—	Rawcliffe, York	—	5 gs., h. b. 2½ gs. &c.
Sirlock	brown ..	12	by Sheet Anchor, out of Nanette, by Partizan ..	started 5, won	—	—	untried.	—	Barney Guist, Norfolk ..	Mr. Barratt	5 gs., h. b. 2½ gs.
Sir John Banley- corn	brown ..	21	by The Baron, out of Loveslip, by Camel	started 4, won	—	—	untried.	—	Rawcliffe, York	Messrs. Wetherby ..	5 gs., h. b. 2 gs.
Sir Michael	bay	—	an Arabian	—	—	won races in Bombay and Ceylon	—	—	Exton, Hants	Mr. Wheeler	2 sovs.

STALLIONS FOR THE SEASON, 1861—(Continued).

Name.	Colour.	Age	Pedigree.	Performances.	Principal Performance.	No. of winners out by.	Sire of	Standing at	Apply to	Price.
Sir Peter Laurie	bay	17	by The Saddler, out of Well-a-day, by Priam	winner of many	steplechases	untried.	—	Cheltenham	Mr. W. Holman	12 gs. (30 mares)
Skrimsner	bay	7	by Voltigeur, dam by Gardian	started 23, won 8	won Asot Cup	untried.	—	Ruford, Olferton	Messrs. Wetherby	5 gs., h. b., 3 gs.
Slingstone	black	4	by Touchstone, out of Charlotte, by Liverpool	never appeared ..	—	untried.	—	Southern Bottom, Croydon	Mr. G. Simpson	5 gs., h. b., 2½ gs.
Snowden Dunhill bay	bay	11	by Lago, out of Daughter of Toscar, by Bay Middleton	started 47, won 13	won Chesterfield Handicap	2	Knayton	Bevelly and Malton ..	Mr. Bringham ..	6 gs., h. b., 3 gs.
Spanish Jack	brown	18	by Don John, out of Miss Lydia, by Walton	started 3, won 1	won £70 at Newton	2	Donna	Clay Hill, Kent	C. Swift	£2 10s.
St. George	black	20	by Danmell, out of Whim, by Dromed	ran well in Ireland ..	—	1	Knight of Avon	Holcombe, Somerset ..	W. Lansworthy ..	3 gs., h. b., 2 gs.
Stiletto	black	10	by Touchstone, out of Phoebe, by Velocipede	started 0, won 19	won £135 at Chester ..	29	Mrs. Stowe	Ragghorpe, Middleham ..	Mr. T. Dawson ..	10 gs. (30 mares)
Stonewell	chestnut	12	by The Baron, out of Pocantonia, by Glencoe	started 21, won 19	won St. Legier	29	St. Albans	Bawcliffe, York	Messrs. Wetherby ..	10 gs.
Storm	bay	13	by Touchstone, out of Ghaznee, by Pantalon	started 2, won 9	won £195 at Doncaster ..	12	Sormast	Redlands, Reading	Mr. Dibbin	10 gs., h. b., 2 gs.
Sugar Plum	chestnut	8	by Sweetmeat, out of Irish Queen, by Hawkway	started 2, won 9	won the Derby	43	Little Children	Waterstown, Ireland ..	Mr. Evelyn	30 gs. (20 mares)
Surplice	brown	16	by Sweetmeat, out of Colfax, by Priam	started 16, won 9	won the Derby	47	Minecart	Danaburgh, Scotland ..	Mr. S. Quince	5 gs.
Sweetmeat	brown	17	by Gladstone, out of Colfax, by Priam	started 24, won 23	won Queen's Vase	untried.	—	Stanton, Shifnal	Mr. S. Quince	15 gs.
Sweet William	bay	15	by Sweetmeat, out of Achythes, by Thirk	started 3, won 8	won Getwicks Stakes ..	23	Petra	Stanton, Shifnal	Mr. S. Quince	15 gs.
Tadmor	brown	13	by Long out of Palmyra, by Sultan	started 11, won 10	won the Derby	30	Mayonaise	Rydon, Diss	Mr. A. Gray	30 sovs. (30 mares)
Teddington	chestnut	15	by Orlando, out of Miss Twickenham, by Giles	started 18, won 10	won the Derby	untried.	—	Theobald, Enfield	Mr. Brown	10 gs., h. b., 5 gs.
Touchwood	bay	5	by Touchstone, out of Bonnie Bee, by Glamis	Giles never appeared ..	—	untried.	—	Childwick, St. Albans ..	Mr. Brown	10 gs., h. b., 5 gs.
Tournament	bay	7	by Touchstone, out of Happy Queen, by Venison	started 36, won 18	won Stewards' Cup	untried.	—	St. Anne's, Lewes	Mr. Drewitt	10 sovs. (30 mares)
Toxophilite	bay	6	by Longbow, out of Legedmain, by Pantaloon	started 18, won 11	2nd for the Derby	untried.	—	Doncaster	Mr. Cunningham ..	10 sovs. (30 mares)
Trabuco	brown	4	by Windhound, out of Manilla, by Mulatto	started 36, won 8	won £120 at Manchester ..	untried.	—	Spofforth, Weatherby ..	Mr. Groves	10 gs.
Trapper, The	bay	10	by Ion, out of Prairie Bird, by Gladstone	started 6, won 2	won Duke Michael St ..	untried.	—	Theobald's, Enfield	Mr. Gray	10 gs.
Trumpeter	chestnut	5	by Orlando, out of Cavatina, by Redbank	started 4, won 2	won Newmarket Biennial ..	untried.	—	Althorpe, Northampton ..	T. Wilson	10 gs. (30 mares)
Turnip	bay	15	by Taurus, out of Cladisa, by Defence	started 5, won 3	won Chesterfield Cup	16	Butterfly	Englefield, Staines	Mr. Crocker	15 gs.
Ugly Buck, The	bay	20	by Venusou, out of Monstrosity, by Plenipo	started 5 won 3	won 2000-guinea-Stakes ..	25	Ammonia	Scaldwell, Northampton ..	Mr. Drage	5 sovs., h. b., 3 sovs.
Vandermulin	brown	8	by Van Tromp, out of Miss Julia Bennett, by Mutley Moloch	started 20, won 8	won Warwickshire H. ..	untried.	—	Willenden	Mr. Phillips	10 gs., h. b., 5 gs.
Vanit	brown	5	by Vaticen, dam by Pantaloon	started 1	—	untried.	—	Blythe, Workson	Mr. T. Hudson	5 gs., h. b., 2 gs.
Vedette	brown	7	by Voltigeur, dam by Birdcatcher	started 10, won 8	won 2,000 gs. Stakes	untried.	—	Rydon, Diss	G. Sturgeon	20 gs.
Vengeance	bay	9	by Chanticleer, dam by The Saddler	started 21, won 7	won Cesarewitch	untried.	—	Horsbourn, Hants	Mr. Milford	10 sovs.
Venderer	bay	4	by Flaccater, out of Snow-drop, by Heron	never appeared ..	—	untried.	—	Lindors, Colford	J. Gatfield	10 sovs.
Voivode	chestnut	8	by Surplice, out of Hybla, by The Provost	started 1	—	untried.	—	Manuel Hall, King's ..	Mr. R. Taylor ..	5 gs., h. b., 3 gs.
Voltigeur	brown	14	by Voltaire, out of Parisa Lynn, by Mulatto	started 11, won 5	won the Derby	39	Vedette	Norton	Mr. Smallwood ..	50 sovs. (30 mares)
Vulcan	brown	23	by Verulam, out of Puff, by Teniers	started 25, won 13	won Liverpool Cup	29	Araguthsheese	Middlethorpe, York ..	Mr. Watson	3 gs.
Warlock	roan	8	by Birdcatcher, out of Ephine, by Emilius	started 19, won 6	won St. Legier	untried.	—	Chelwell, Tothnes	Mr. Croft	10 gs. (30 mares)
Weatherbit	brown	19	by Sheet Anchor, out of Miss Letty, by Priam	started 8, won 8	won Four-year-old S. ..	38	Beadsman	Paddock, Sheffield	Mr. Massie	20 gs. (20 mares)
Wild Dayrell	brown	9	by Ion, out of Ellen Middleton, by Bay Middleton	started 4, won 3	won the Derby	8	Buccaneer	Chilton, Hungerford ..	Mr. Rickaby	30 gs.
Wild Huntsman, The	bay	11	by Hawkway, out of Honey Dear, by Plenipo	started 26, won 11	won Gt. York Handicap ..	untried.	—	Fairfield, York	T. Fletcher	6 gs.
Windhound	brown	14	by Birdcatcher, out of Phryne, by Touchstone	started 6, won 1	won £74 at Reading	16	Thormanby	Spofforth, Wetherby ..	Mr. Groves	20 gs.
Yellow Jack	chestnut	8	by Pantaloon, out of Jamaica, by Liverpool	started 7, won 1	ran second 6 times	untried.	—	Newmarket	Messrs. Barrow	11 gs., h. b., 5½ gs.
Young Melbourne bay	bay	6	by Melbourne, out of Clarissa, by Pantaloon	started 1	—	untried.	—	Doncaster	Mr. Cunningham ..	15 sovs. (20 mares)
Zingaro	bay	5	by The Fallow Buck, dam by Voltaire	never appeared ..	—	untried.	—	Dorney, Windsor	—	25 gs.
Zuyder Zee	bay	7	by Orlando, out of Barbelle, by Sandbeck	started 32, won 10	won Chesterfield Cup ..	untried.	—	Ruford, Olferton	Messrs. Wetherby ..	10 sovs., h. b., 5 sovs.

The Groom's Fee, if not included, varies from a Guinea to Half-a-Crown.

CALENDAR OF AGRICULTURE.

The sowing of all grain crops must now be finished as fast as possible, and also of lucerne and flax seed. Finish the preparation of grass meadow-grounds. Sow vetches for green food, and grass seeds on wheat and barley tilths. The surface of winter wheat lands will be rough and stale; harrow the land before sowing the grass seeds, and again after the seeds are sown, and roll with a heavy weight.

Get prepared as quickly as possible the green crop lands; and towards the end of the month sow beet-root in drills well dunged, and 28 inches apart. Steep the seeds in weak solutions, and dry with hot lime. Plant potatoes in drills 30 inches apart, and well dunged with farm-yard manure in a half-putrefied state. Use strong sets newly cut, very moist dung, and in a large quantity. Cover the new drills quickly, and roll them down. Before the land is drilled, apply hot pulverized lime at the rate of 200 bushels per acre, and spread it evenly, and harrow it in immediately; or strew the hot cinders evenly over the ground, and the subsequent workings of the land will mix the lime, which will be powdered by the dampness of the soil. This mode requires an earlier application, but it must be very beneficial to the land, by reason of the damp and moist exhalations that will be evolved during the dissolution of the hot cinders.

Early crops will now require both horse and hand hoeing, as carrots, lucerne, wheat, beans, and peas.

Paring and burning of land will now be done in a good season; burn the turves moderately, into a black torrefied mass, as in that state there is present the most carbonaceous matter. It is the best method yet known for bringing into cultivation all lands that contain much fibrous, inert, and ligneous matters.

Burn, for application by the drop drill for turnips, all vegetables, and earthy substances found on roadsides and ditch banks, also moss and all combustible matters.

Rye and watered meadows, winter barley and vetches, will now be ready for soiling cattle in the yards, and for being consumed on the ground by ewes and lambs. The food is best used by being cut, and placed in racks, which are regularly moved over the mown ground. Fold the sheep nightly on the mown space, allowing in the fold two square yards to each animal, and two nights on one place. All bare grounds and inferior grass lands may be much improved by the folding of sheep on the surface.

The lambing season will now draw to a close. When beet-root and cabbages fail as food for the ewes, use oats and bruised oilcake mixed, and a portion of salt. Remove the stronger lambs to the pasture-fields.

Attend to the milch cows and the suckling of calves. Give the cows an ample supply of juicy food, natural or prepared: to the calves as much milk as they will take. When begun to be weaned at the end of 16 weeks, give them, in racks in the calf pens, young vetches, bruised cake, bean and barley meals boiled, and linseed jellies, with chalk and rock salt to lick. The latter article will quicken the action of the digestive organs, and the former will correct the crude acidities of the stomach.

The last remaining fattening bullocks will be sold during this month. Use oilcake in finishing off the animals. The most backward in condition must go to grass.

The season of curing bacon being over, all pigs on hand must go on for summer stores, and come in for early winter fattening. The earliest fat lambs will now come in for sale.

During wet weather, carry all the dung from the cattle yards, to the heaps in the fields, and litter the yards afresh for the summer soiling of cattle and horses.

Prepare, by ploughing, harrowing, and rolling, the fallow lands for green crops, keeping most forward the portion to be sown with Swedish turnips next month. Plough clay lands for wheat fallows.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Asparagus will now come forward, and must be cut, so as not to injure the crowns by too rigid incisions, or by uselessly wounding the adjoining shoots. Seakale beds are sown in single rows at four feet distant, or in double rows at two feet asunder. Sow lettuce, radish, and small salading twice or thrice. Sow peas, the Prussian and scimitar; beans in the most approved sorts; borecole, including Scotch kale, and Brussels sprouts; broccoli; for winter and spring, white Siberian hardy; and the late dwarf cabbages and savoys will supply successions, if sown early and late in the month. Spinach repeatedly; silver onions very

thickly, for drawing young. Onions for bulbing; and leeks, if not already sown; carrots, parsnip, and red beet—all in the first days.

Celery—Seymour's white, and hardy red—in gently warm-leaf beds. Nasturtiums and aromatic herbs.

Kidney beans of both kinds, if the soil be warm and dry; sow early, and before the 15th.

Plant potatoes; artichoke suckers, if well-rooted, in prepared beds, choosing showery weather.

Transplant lettuces (but expect them to run), cabbages, cauliflowers, and seakale; and prick out, in beds of very rich soil, consisting chiefly of reduced manure, a number of celery plants to become stocky.

Dress all the beds with hoe and rake; earth up and stick peas, and attend to neat order.

FRUIT GARDEN.

Place mulch about and over the roots of trees, and supply water largely in dry weather to strawberry beds, or rows newly planted.

FLOWER GARDEN.

Attend to annuals in pots, and thin out the seedlings; plant herbaceous varieties; hoe and neatly

rake the quarters; sweep and roll lawns; renew box edgings, or plant afresh; clean and roll the walks of gravel. Geraniums, and all succulent plants, require shiftings; and heaths, and all wooded plants, in dry, airy pits facing the north and east.

Guano in fine powder, one ounce to the gallon of soft water, is a most useful stimulant to succulent plants of many kinds.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MARCH.

Notwithstanding that the weather during the greater portion of the month has been changeable, out-door farm labours have made considerable progress; nevertheless, they are by no means forward—the time of year considered. The general appearance of the young wheat plant is, on the whole, somewhat favourable; but it is a matter for regret that the quantity of wheat sown during the autumn months, arising from the backward state of the harvest, and the saturated condition of the soil, was very small, when compared with most previous seasons. This circumstance may possibly, reduce the value of the forthcoming crop considerably because, in a general way, the winter wheats are more prolific and valuable than those sown in the spring.

The somewhat rapid upward movement in the value of wheat—the rise in prices during the month having been from 3s. to 6s. per qr.—has induced the impression in some quarters that we shall continue to have excited markets, and that the finest qualities of home-grown wheat will reach 90s. per qr. prior to the commencement of harvest work. The activity in the trade appears to have arisen chiefly from the increased demand on the part of the country millers at London and Liverpool, and the moderate nature of the importations from abroad. It is possible, too, that the supplies of foreign wheat and flour have become much reduced; so that, until after the Baltic navigation is open, our markets may continue to be very moderately supplied with wheat, and, as a consequence, the quotations may gradually creep up. We must bear in mind, however, that America still appears to have an enormous surplus quantity of food on hand, and that present prices here are sufficiently high to give the shippers a fair amount of profit on consignments. From that quarter, therefore, we may look forward to liberal supplies, and we see no reason whatever to anticipate any falling off in our importations from the continent during the remainder of the year. As far, therefore, as supply is concerned, there is no reason to apprehend any scarcity; but, at the same time, we believe that even a heavy importation would not have the effect of reducing present quotations, more especially as money is becoming cheaper in the discount market, and as our millers hold very light stocks of wheat. Our reasons for this opinion are chiefly grounded on the fact that the last crop of English wheat is still proving very deficient, and that a large portion of it cannot be converted into flour without a heavy admixture of foreign grain.

The last crop of barley in this country appears to have turned out much larger than was at one time anticipated; the barley trade has, therefore, continued in a most inactive state, and prices have had a drooping tendency. The Scotch barleys received up to Mark-lane have turned out remarkably fine, and sold at corresponding quotations. We have nothing special to remark in reference to other kinds of produce, save that flour has produced a rise of from 1s. to 2s. per sack.

The wool trade has been in a most unsatisfactory state. The public sales of colonial wool held in the metropolis have gone of heavily. Fine qualities have changed hands at a decline in the quotations of 1d., and other descriptions have given way fully 2d. per lb. English wools have suffered in an equal proportion, the fall in their value having been

1d. to 1½d. per lb., at which very little business has been transacted. The demand for export has been trifling in the extreme, and very few parcels of the new clip have, as yet, been disposed of.

The metropolitan markets still continue to be heavily supplied with potatoes, chiefly from Scotland and the North of England, in good condition. The demand has not improved, and the quotations have ruled in favour of buyers. Great disappointment has been expressed by the growers in the midland counties, where the crop turned out tolerably well, at the low prices at which their produce is now disposed of; but the fact is now patent that more really sound potatoes were grown last year, both in England and Scotland, than was at one time anticipated. Apparently, very large quantities have yet to come forward.

* Both meadow and clover hay have sold slowly on easier terms; but the value of straw has advanced from £1 10s. to £1 18s. to £1 18s. to £2 per lb. Meadow hay has realized £2 to £5 5s., and clover £3 to £5 15s. per load. Much of the former still appears on sale in very bad condition.

There has been about an average business doing in the fat stock markets, yet prices have not been supported. The beasts arriving from Norfolk for consumption in London are of remarkably good quality.

In Scotland wheat has produced rather more money, with a fair consumptive demand. The large quantities of American flour held at some of the ports have, however, prevented anything like activity in the trade. Barley and most other articles have sold off slowly, although the inquiry for the south has not fallen off to any extent.

The Irish markets have been firm for wheat, at a slight improvement in value. Fine barley and oats have changed hands steadily, at full prices; otherwise, the trade is heavy. Potatoes continue on offer in fair abundance.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

During nearly the whole of the month, the Metropolitan Cattle Market has been well supplied with beasts from Norfolk, in, for the most part, prime condition; indeed, we may assert that the quality of the stock received from that country has been seldom equalled, much less excelled at any former period. The additional weight of meat thus on offer has had some influence upon the demand, and prices have shown a tendency to give way. However, very prime Scots and crosses have sold as high as 5s.; but the more general top figures for those particular breeds have not exceeded 4s. 8d. and 4s. 10d. per 8lbs. The sheep have, we regret to state, come to hand in poor condition; hence prime Downs, in the wool have realized 6s.; out of the wool fully 5s. per 8lbs. The rot has, unfortunately, continued to show itself amongst many of the long-wooled sheep, which, of course, have been disposed of at miserably low prices. The lamb trade has opened steadily, at from 7s. to 8s. per 8lbs.; but the number of lambs hitherto disposed of this season is unusually small, still we hear no serious complaints of the past having been a poor fall. In the provincial markets prices generally continue high—higher, in some instances, than in London. As the supplies exhibited in them have not fallen off, it would appear that the consumption of meat has not decreased.

Advices from Holland state that large numbers of both beasts and sheep are in process of fattening for shipment to England, but that the quotations continue too high to admit of speculative investments from this side.

The imports of foreign stock have been moderately good, as will be seen by the annexed figures:—

	HEAD.
Beasts	2,811
Sheep	5,604
Calves	505
Pigs	171

Total	9,091
Total in 1860	10,459
1859	10,548
1858	1,511
1857	5,419
1856	1,842
1855	2,108
1854	8,409
1853	10,884

The total supplies of stock exhibited in the great Metropolitan Market have been as under:—

	HEAD.
Beasts	18,560
Cows	530
Sheep	85,270
Calves	700
Pigs	2,410

COMPARISON OF SUPPLIES.

	Beasts.	Cows.	Sheep.	Calves.	Pigs.
March.	18,160	495	93,409	853	2,042
1860.....	16,810	612	94,775	695	2,890
1859.....	17,821	476	74,410	704	1,915
1858.....	17,345	400	74,880	1,118	2,230
1857.....	22,623	470	100,700	797	2,140
1856.....	18,614	380	88,790	834	2,765
1855.....					

In the course of the month about 8,900 Scots and crosses came to hand from Norfolk, Suffolk, Essex, and Cambridge; 4,000 various breeds from other parts of England; 900 Scots and crosses from Scotland; and 28 oxen from Ireland.

Beef has sold at from 3s. 2d. to 5s., mutton 3s. 6d. to 6s., lamb 7s. to 8s., veal 5s. to 6s., and pork 4s. to 4s. 10d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	March, 1857.	March, 1858.
	s. d. s. d.	s. d. s. d.
Beef from	3 4 to 5 0	2 10 to 4 6
Mutton	4 2 to 6 0	3 0 to 5 2
Veal	4 4 to 5 8	4 0 to 5 2
Pork	3 6 to 5 2	3 0 to 4 4
	March, 1859.	March, 1860.
	s. d. s. d.	s. d. s. d.
Beef from	3 6 to 5 2	3 4 to 4 10
Mutton	4 0 to 6 0	4 0 to 6 0
Veal	3 10 to 5 8	3 10 to 5 8
Pork	3 4 to 4 4	3 4 to 4 4

Newgate and Leadenhall markets have been seasonably well supplied with beef and mutton, which have sold slowly on easier terms. Lamb has realized 6s. 6d. to 7s. 6d. per 8 lbs. Veal and pork have commanded full quotations.

SOUTH LINCOLNSHIRE.

"March many weathers" keeps, as usual, quite its old character here for vicissitude of sun and wind, rain and frost—now warm, now bitterly cold—now a terrific storm, in a few hours genial sunshine and warmth. The variations are great; but the predominance has been cold. Hence our wheats have not recovered to any extent, and the plant still looks thin, backward, and very "patchy." It requires great judgment to decide what to do with them. Some must be ploughed up; others may be eaten off, if the land is good and fertile. It will thicken it considerably if eaten off quickly, when the land is dry. Other crops must be early hoed, and again repeated in May. We are all busily engaged putting in our Spring crops. The land for the

most part is very tough, and requires much labour to reduce it to a fair seed-bed. It is not hard, but tough—the harrows cannot pulverize it. The roller does not crush it—many furrows remain almost whole, with a slight covering of mould upon them. This is very unfavourable to the progress of the plant; but in many cases nothing more can be done. In one case three treble-horse harrows were passed over, then thrice harrowed with two heavy two-horse harrows, without making a good seed-bed. On some of our lighter soils, where the frost had penetrated deeply, and the melted snow had passed away, much less difficulty is experienced. Nevertheless, we shall complete our seeding, upon the whole, with tolerable satisfaction; and if a deep fall of snow is conducive in promoting fertility, we must realize a good crop. Beans, peas, and barley are nearly all sown. Oats (our chief Spring crop) is in course of seeding; but we have to await the finishing off our mangolds and turnips to complete this sowing. Preparations are rapidly making for putting in the potato crop, and much anxiety is expressed as to the hazard of the next season; and no one can wonder, as the past was nearly a total failure. We trust our growers will try their best to procure varieties free from disease. These may be procured from Scotland through a respectable salesman. If this precaution is taken, together with a favourable Summer as to weather, a satisfactory crop may be anticipated. It is worthy of remark that it is surprising how soon the varieties degenerate and become diseased. Fallows are very backward, and likely to be, owing to the difficulty named above causing so much extra work. Mangolds and swedes hold out well; and where they were properly covered have escaped the frost, severe as it was. Store stock have wintered tolerably well, considering the injury sustained by the straw in the past harvest. Sheep, too, have done satisfactorily, and, notwithstanding the depression in the wool trade, are selling at high prices. Fat cattle and fat sheep are alike very scarce. Pork is in abundance, owing to the large quantity of inferior wheat which has been made into food for pigs. The price of pork has lowered considerably, so much as one shilling per imperial stone. Wool is scarce; but the price is lower, owing to the London sales, and price of money. The stock of wheat in the farmers' hands is less than for many years past; but as yet it is out of condition. The few samples of dry useful grain make a good price; but inferior can scarcely be sold. The variation of price is as great as ever. Our grass lands look promising, and where laid in, the grass is beginning to grow. The price of labour has been good throughout the Winter, i. e., 12s. a week for ordinary labourers, 16s. for carting, &c.; and much employment has been found, as every farmer seemed inclined to do his best to keep the poor labourer engaged. This will be felt in the better condition of the cattle and sheep, which have received great attention; indeed, it was necessary to devise every means to economise food, or a sad result would have taken place this Spring. Most of our peas crop has been used for sheep and pig food; and the few potatoes saved from the general wreck have been consumed by pigs, very few being good enough for sale. From the state of our stack-yard, it is to be presumed that a considerable rise in price of grain must speedily occur; but for us it will be of little avail, as so much is gone. The general complaint is a want of money, at which no one can wonder, as this is the second if not the third bad year for this district.

HERTFORDSHIRE SOUTH.

We hoped by this time to have been able to give a report satisfactory alike to ourselves and the country; but we regret we cannot do so. The greater part of the young wheat looks bad, and the frosty nights and cold rains we have lately experienced sadly cut it up. We had good farming weather from the 1st to the 22nd of February, and those who had their land ready put in beans and peas, which are just showing above ground. Too many farmers had to make up their time lost in the autumn, and complete wheat-sowing, and we notice the wheat sowed in February looks exceedingly well. Many fields of clover lay wheat have been ploughed up and resown, whilst other fields look so bare that one can scarcely tell if there be any plant left. The last four days of February very wet and stormy (saving the character of the month); since which we have had a succession

of windy and rough weather—trying alike for man and beast. The brief intervals have been seized to put in spring corn, and a considerable breadth of oats has been sown, with a limited quantity of barley. Winter oats have so completely gone off that many farmers have ploughed up their entire crop, one large grower to the extent of 70 acres. We are not partial to winter oats as a crop, and cannot see the advantage to be derived from growing them in preference to spring oats. To be sure, by sowing oats in the autumn, we are relieved of part of our spring labour, but we fancy the land would rather be relieved of the crop for the winter months, and be as well laid up in ridges, subject to the beneficial influences of frost. However, another such winter as the last will satisfy the most devoted admirer of winter oats, and cause their cultivation to die away, as the growth of winter beans has in a great measure already done. It is no joke to lose 70 acres of corn, the seed and labour for which amounts to a considerable sum. We think the breadth of wheat for this year is quite an average for our district, but a greater proportion than usual is spring-sown. All kinds of roots pitted in November have kept tolerably well, but the swedes left standing in the fields rotted extensively. The quantity of hay in the country is large, but much of it is scarcely fit for food: at any rate it must be steamed and mixed with pulped roots before cattle will eat it; and it is doubtful if the animals derive benefit from bad hay, no matter in what form it is given. Clean and good straw has not been so scarce and dear for many years. It is worth from 35s. to 42s. per load in the country; and is expected to be dearer rather than cheaper. The inability of farmers to sell their corn, unless the condition and quality are good, prevents thrashing—as probably nine sacks out of ten are in rough condition. It is many years since we have known so much difficulty in turning corn into money. The former period being when the “man of unadorned eloquence” so zealously advocated the principles of free trade, and prognosticated peace and plenty as the perpetual fruits thereof. But “Paul may plant, and Apollos may water; God alone gives the increase.” Every one is desiring finer and warmer weather. We have had a long and severe winter, whilst now, on the eve of spring, it is loath to leave us. Swedes are just done, wurtzel is rapidly disappearing, autumn-sown tares and rye there are none, and if we do not get a bite of grass until late in April, cattle and sheep will be kept at a serious expense. Let us hope a change for the better will soon come. The lambing season is about over, and the fall is an average. Lambs have suffered from the cold rains, especially if they have not had a little cake and corn allowed them, with shelter at night. We are accustomed to bring our twin lambs and any that are young and weak into the sheep-yard at night, and both ewes and lambs seem glad of the shelter. Fattening sheep have done pretty well through the winter, but they are scarce. Fat beasts are also scarce, and we expect the price of beef and mutton will advance rather than fall. The draining of land received an impetus from the excessive rains of 1860, and the makers of drain-pipes are unable to supply pipes fast enough. We rejoice drainage is on the increase, as every acre of land properly drained is a positive benefit to the country. As the warm weather comes on farmers will do well to look to the state of their pastures before stocking them with sheep, as rotten sheep are already too numerous, and unless care is taken greater losses will be sustained.—March 23.

ISLE OF ELY.

March has come in “like a lion:” whether it will go out “like a lamb” remains to be seen. It has been true to its character thus far, and has displayed its “many weathers.” We have had frost, rain, hail, snow, with one or two mild days, thunder, lightning, and tempests of wind. The last week has been severely cold, and vegetation has made but little progress. The high searching winds have in some respects been beneficial; they have dried up the ground and made the spring seeding do well, and they have also penetrated into the corn stacks, and made the newly-thrashed corn come to hand in greatly improved condition. Our report of the growing wheats, we regret to say, must, upon the whole, be decidedly unfavourable. Here and there a field looks healthy and vigorous, and is assuming its beautiful spring verdure; but these are the exception. Much

looks weak and sickly, and unpromising, with, in many instances, a very thin plant. If such a crop as the present one can ever produce an average yield of grain, it must undergo a very speedy and marvellous change; but this can only be effected by continued genial, spring-like weather. So long, then, as these cold nipping winds and severe frosts continue, we can expect no favourable change. Spring seeding is progressing rapidly and satisfactorily. Beans are sown, and will ere long be showing themselves above ground, especially should we get a few mild days. Oats, too, are largely sown; some were put in in February, and many were drilled the early part of this month. The land is generally wet and cold, and it will be some time before the spring-sown corn will, to any great extent, appear. It vegetates very slowly, but we hope surely. Sheep are selling well, but trade is not brisk, in consequence of the cold storms; were grass to grow quickly, and keeping become plentiful, we should probably see prices advance considerably. Beef and mutton sell at high prices, the latter especially—9d. to 10d. per lb. Pork makes 7s. 6d. per stone. We have at length a little more trade for our fen wheats, and prices have slightly improved: but low qualities are only a slow sale yet. The condition of all fresh-thrashed samples is good, and the intrinsic value of the wheat is thereby increased. Beans are selling at about 1s. per stone, and in some instances are reported to yield badly—from 2 to 3 quarters per acre. Oats are about the same, and are still selling at 13d. to 14d. per stone for good qualities.—March 18.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ABERGAVERNAY FAIR.—There was a very good attendance of horned stock, the quality of some being very good, and the prices realized in advance of those recently obtained. In the horse fair there was a good attendance of capital draught horses, which sold freely at good remunerative prices.

ASHBURTON FAIR.—The supply of bullocks was tolerably good, but not in good condition. Of sheep there was a small supply, and trade was dull. Fat bullocks, 60s. to 64s. per cwt., store ditto 40s. to 44s.; fat sheep 7d. per lb., ewes and lambs 55s. to 60s. per couple. Yolk wool 1s. 2d. per lb.

AYLESBURY PALM FAIR, (Saturday last).—A large supply of all kinds of stock on offer, and trade in everything ruled brisk. The supply of horses was very large, consisting of all kinds, from the £80 nag-horse to the veriest knacker. The trade was very active, and few remained unsold, prices averaging from £30 to £80 for nags, and £20 to £60 each for carthorses. In cow stock there was an excellent supply, both as regards quantity and quality, and farmers and graziers having refrained from buying cow stock during the winter on account of the shortness of keep, there was a large number of buyers at market, consequently trade ruled brisk, and very little was left unsold, prices averaging for milch cows £13 to £23, barreners £9 to £17, heifers £8 to £18, storks and steers £4 to £9 each. For calves there was a good inquiry, and though the supply was large, all were sold. Weaners 26s. to 42s., sucklers 13s. to 38s. each. There was a very large supply of sheep at the fair, and buyers being plentiful a full clearance was effected. Wethers 33s. to 43s., tegs 26s. to 40s., couples 40s. to 46s. each. A few pens of fat sheep sold at 4s. 6d. to 5s. per stone. A good demand for pigs, at full prices. In the butchers' market there was a good supply of slaughtered meat, and trade was active. Beef 6½d. to 8d., Veal 6½d. to 7½d., Mutton 7d. to 8d., Pork 7d. to 8d. per lb.

BANBURY FAIR.—There was a good supply of stock. The prices of beef ranged from 3s. 6d. to 5s., and mutton from 5s. to 6s. per 8lbs. on the average, the brisket trade being in the latter.

BRIDGNORTH FAIR was stocked with a tolerable show of good cattle. Prime beasts for the knife realized fully 7d. per lb. Cows and calves went from £14 to £18. The quantity of sheep penned was small, and not equal to the demand, prime wethers obtaining from 8½ to 9d. per lb. The pig market was well stocked, and they realized from 6d. to 6½d. per lb. The show of horses was scanty, and only a few hacks and waggon-horses were exhibited.

BROMYARD FAIR was well supplied with cows and calves and poor stock; the former sold well, but the latter

were lower in price. Beef fetched 7d. per lb.; sheep and pigs also met with a dull sale. There were a good many horses in the fair, but few purchasers, and little was done.

CAMELFORD FAIR.—The show of stock was much inferior to that shown in past years. There was not a good lot of sheep there. Ewes and lambs sold at £2 and upwards per couple; cows and calves were scarce and inquired for; good fresh steers were also sought after; ordinary kinds of lean stock a dull sale, but the prices of all kinds of stock were much the same as at late fairs.

CARMARTHENSHIRE FAIRS have been held at Lampeter and Maenclochog on the 11th, at Mydrim, Llanarth, and Llangadock on the 12th inst. There were but very few cattle for sale at each of those places, as the dealers have not yet commenced their trade for the season; about the usual number of horses and colts were shown, with a few useful nags. Although a fair amount of business was done the trade cannot be called brisk, at stationary prices. Pigs of all descriptions continue in fair supply and demand, at highly satisfactory rates.

CORNHILL MARKET.—Fat was not ruling so high as

they were some weeks ago, but young stirks, although in abundance, were selling at extraordinary prices. Mr. Allan, Glassaugh, two stots at £52; two stots from the Rev. John Innes, Fordyce, sold at £47; Mr. McConnachie, Linkbrae-heads, three beasts at £54; Mr. Stuart, Clean, Deskford, four queys at £72 less luck-penny; Mr. J. Stevenson, New Mills of Boyne, three beasts at £17 7s. 6d. each; Mr. Murray, Muckletown two queys at £31. Coming two years: Mr. Clark, Birkenbog, five beasts at £17 each, and two stots at £18; Mr. Stevenson, Legamill, a stot at £15 12s. 6d.; Mr. Brown Auchlandland, two stots at £27; Mr. Ogilvie, Ternennie, two stots at £26. Last year's calves sold at from £5 to £9. Cows calved, or to calve fetched from £10 to £18.

DUMFRIES PORK MARKET.—The number of carcasses was larger than last week, namely, 390; most of these were of the secondary description. There was an average attendance of buyers, but transactions somewhat slow. The prices were a shade lower than last week, namely, prime carcasses 7s. 4d. to 7s. 6d. per imperial stone, secondary 7s. 2d. to 7s. 3d., over-light 6s. 8d. upwards.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The character of the past month was not seasonable. Only the third week was fine, and that not wholly so. The earlier and later portions were stormy and wet, leaving the soil very sodden at the period when it is generally dry and dusty. Small growth has, therefore, been made by the young wheat, and a much less quantity sown than usual, the deficiency in planting being probably one-eighth. Our prospects, therefore, of a wheat crop, are not encouraging, as spare sowing cannot be expected to yield abundantly, more especially as much that is up still looks weak and sickly. A good deal has been said in favour of the spring wheat called "April," which in some seasons has certainly done well when late-sown. But practical men have found that all late agricultural movements are extremely doubtful in this climate; and the probability now is, that much of the land prepared for wheat will be used for spring corn, as, should good spring wheat be wanted, where are the samples? Even for Lent corn, the weather has been bad; but there is time yet for a favourable change; and though the public are likely to have a diminished supply of British wheat, farmers may do better than of late.

We have now reached a point since harvest when a comparison can be made of the deliveries for the last six months; and we find them to stand thus—viz.: The last three months of 1860 and first three months of this year show the sales noted to be 1,846,703 qrs., against 3,166,607 qrs. for the same period of 1859-60, the deficiency being 1,319,904 qrs. The proportions, therefore, are as about 7 to 12; and if this be taken as a fair index of last year's yield, it is much worse than even the late careful statistics of the *Mark Lane Express* revealed. The markets have, therefore, been improving for all useful qualities of English growth, the general advance for the month being 4s. to 5s. per qr.

Foreign supplies, though still good, have been less, trade, till lately, being dull, and much op-

pressed by the high rate of discount; but, as the money market is improving, and our entire stock of English wheat must be reducing fast, we may expect to see more healthy markets, and probably some further advance, till the Baltic fairly opens, and larger foreign supplies fall in.

France has of late been gradually rising in her markets, her crops being short, though not to an equal extent; and smaller supplies have appeared in the provinces—so much so, indeed, of late, that, instead of a revived prospect of supplies here from Nantes and Bordeaux, those ports are now closed by the higher rate of duty: and there have been inquiries in London for American flour; and even the Baltic markets, during the cessation of exports, have kept up their rates better than expected.

Though affairs should settle pacifically on the Continent, we are not without fears of civil war in America, which would immediately limit our arrivals.

The following rates have been ruling at the places named: The best native wheats, at Paris, weighing about 62½ lbs. per bush., was worth 63s.; second qualities, 59s. per qr. American red, at Antwerp, was 62s. 6d.; low Zealand white, 55s. per qr. Native wheat, at Rotterdam, 56s.; Baltic red, 73s. 6d. per qr. Fine Wahren red, at Hamburg, 61s.; Hungarian, 56s. 6d.; kilndried Danish, 54s. per qr. At Königsberg, 62½ lbs. mixed, 60s. per qr. Red, at Cologne, 55s. 6d.; for delivery, 54s. 6d. per qr. Wheat, at St. Petersburg, for August, 50s. 6d.; at Odessa, 46s. to 50s. 6d. per qr. Soft Berdianski, at Genoa, 60s. per qr. Hard wheat, at Algiers, 52s. 6d.; soft, at Oran, 62s. 6d. per qr. Blanquillo wheat, at Burgos, 46s. per qr., the Spanish markets being easier, from more favourable weather. Flour, at Santander, 42s. per sack; wheat, 59s. to 60s. per qr. New York prices had been irregular, closing firmer—spring wheat, 42s. to 45s.; red winter, 48s. 9d.; white, 50s. to 57s. 3d. per qr.

The first Monday in London opened on moderate

supplies of wheat, both English and foreign. The show from Kent and Essex was then as small as any since harvest, and had not the market been previously in a low state there would have been some advance. As it was, the few good parcels of home-growth exhibited, only brought former rates, inferior qualities remaining neglected. The small supply, however, gave greater firmness to holders of foreign, and buyers, though not numerous or eager, had to pay quite as much money for fine qualities. There was a very general agreement this week in the country reports, almost all but Liverpool only quoting a quiet state of trade at the previous currency. Liverpool having been depressed during the previous week, there was some recovery noted, more especially on low American sorts, which were in demand at 2d. per cental more money. Both Scotland and Ireland agreed with the general reports of sameness. The second Monday had an improved foreign supply, with very little of home growth. The morning's show from the near counties being again much below the average, English factors were enabled to place selected qualities at 1s. to 2s. per qr. advance, and there was a more free riddance of low sorts. The foreign trade was rather improved, and an occasional advance of 1s. per qr. on some sorts was realized. Cargoes off the coast were, however, not a very free sale, though holders only required previous rates. This week most of the country markets followed London as to the extent of the rise; but Birmingham, having a larger show than usual, was no dearer, but dull. Newcastle, Leeds, Manchester, Stockton-on-Tees, and Bristol were 1s. per qr. up. Hull, Nottingham, Leicester, York, and many places were 1s. to 2s. per qr. higher. Newark, Spalding, and Ipswich called the advance of 2s., and Norwich rose 2s. to 3s. per qr. Liverpool, for the entire week, was 1d. to 3d. per cental dearer. The third Monday had a moderate arrival, chiefly from America and Spain, with but a short supply of home-growth. The contribution from Essex and Kent this morning was again very insignificant, and a further rise of 1s. to 2s. per qr. on good qualities ensued; but, notwithstanding there were so few samples of low qualities, these were hard to quit at former rates. A better attendance from the country appeared than for a month past, and there was a proportionate amount of business doing in good qualities, foreign at 1s. per qr. more money, but the low Russian and Danubian qualities were very little inquired for, and not at all dearer. The majority of the country markets this week scarcely equalled London in the advance. Sheffield, Louth, Newark, and Bristol were not dearer. Manchester, Newcastle, Norwich, Boston, Leeds, Stockton-on-Tees, and many other places did not call the rise more than 1s. per qr.; but Hull, Spalding, Market Rasen, Gainsborough, Newmarket, and Gloucester were 1s. to 2s. higher per qr. Liverpool was 2d. to 3d. per cental dearer on Tuesday, the rise only being confirmed on Friday's market. The fourth Monday opened on a moderate foreign supply, with but little of home growth. During the morning Kent and Essex again sent up but few samples, and fair-quality English being more in request, the few lots of

good brought 1s. to 2s. over last week's rates; but though there were not many samples of rough quality, there were very few of them got rid of. Fine-quality foreign was held at fully former rates, and second sorts, more especially red American, sold at quite 1s. per qr. improvement, but low descriptions were not inquired for. Cargoes afloat were unaltered in value.

The imports into London for four weeks were 12,013 qrs. English and 52,208 qrs. foreign, against 28,361 qrs. English and 5,590 qrs. in 1860.

The flour trade during the month has not participated in the improvements noted in wheat to a like extent. Norfolks, which opened at 39s., closed at 40s.; but American barrels, notwithstanding free imports, have increased in value nearly 2s. per brl.—extra superfine being 32s. and double to 35s. This has arisen from their superiority over country make, as well as from their keeping better. Town millers, notwithstanding the advance in wheat, have kept their top quotations down to 57s. all through the month; but we expect soon to see a rise of 3s. per sack.

The London imports for four weeks were 53,675 sacks English and 4,067 sacks 65,471 brls. foreign, against 74,339 sacks English and 304 sacks 11,199 brl. in 1860.

Barley, all through the month, has been a very heavy sale, and declining. For a time during the coldest part of the month, some demand existed for malting qualities; but this has been wearing-out, with the advancing season, and values have been quite uncertain; secondary qualities have given way fully 3s. per qr., and are still difficult to place. Even grinding sorts, though relatively cheaper than oats, have cheapened fully 1s. per qr. Malting sorts held out better than at one time expected; but this must rather be attributed to the reduced demand for malt, than any quantity of suitable barley. The better sorts we expect will still be lower; but those for grinding must be in good demand, and cannot be expected to fall much.

The imports for four weeks into London were 13,487 qrs. British and 58,013 qrs. foreign, against 17,886 qrs. English and 25,412 qrs. foreign last year.

Malt, though dull, has not altered in value.

The high prices that have long ruled for oats have very much restricted the demand, and, as supplies from Sweden and Denmark have been arriving in fair quantities, new corn of all sorts has gone down in price 1s. to 1s. 6d. per qr.: even good old in granary has been rather in buyers' favour. But stocks must now be so materially reduced from the long limitation of supplies by water, that on the arrival of a large fleet, we expect dealers will be free in their purchases, whether there be a further reduction in prices or not. The better crop of English this year, though poor in quality, has greatly served to fill up the void in foreign and Irish imports.

The imports into London for four weeks were 16,494 qrs. English, 4,124 qrs. Scotch, 7,818 qrs. Irish, and 51,934 qrs. foreign, against 13,455 qrs. English, 653 qrs. Scotch, 4,900 qrs. Irish, and 25,328 qrs. foreign in 1860.

Beans have been dull, but steady as to value. The new English show but little improvement in quality as yet, and have therefore been a very slow sale, but always being low-priced they have gradually worked off the markets. Good English being scarce have remained dear, and foreign of all sorts have been pretty firm; we do not anticipate much change of value. The imports for four weeks were 1,963 qrs. English, 8,180 qrs. foreign: against 5,582 qrs. English, 5,532 qrs. foreign in March 1860.

Hog peas have been dull—maples from their high price, and the cessation of the demand for seed; and duns from their soft and inferior quality; but white boilers being now past their season have declined in value fully 2s. per qr., and without Government contracts, they will be worked off for horse feed, as they are not dearer than good beans. The four weeks' imports for London were 1,029 qrs. English, 2,025 qrs. foreign: against 1,585 qrs. English and no foreign in 1860.

With free imports of linseed in the first week of March the market became dull; but supplies since then falling off, the trade has recovered tone, and as the late imports from the East Indies lost money we do not expect a further decline at present. Cakes all through the month have sold well, from the scarcity of fodder.

The seed trade hitherto has been excessively disappointing. With an almost total failure of the English crop, there has yet been very little demand for foreign. Good American red had, however, fallen so low as to attract some buyers, and has, at last, recovered about 2s. per cwt. from its lowest point. Fine French has kept its value, and so have white seed and fine trefoils. Should the weather take up fine, there will no doubt be a revival in trade, and some extensive demand as yet, with possibly improved rates for red seed; but no doubt some holders, on the other hand, will get anxious rather to sell in season than keep on speculation; so, much change cannot, therefore, now be expected. Tares being offered abundantly have been retarded in sale by the ungenial weather, and have been bought at irregular rates. Canary seed has remained exceedingly heavy. Mustard seed only nominal as to value. Other seeds much as last month.

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Feb. 9, 1861	54 0	39 8	22 6	36 3	39 10	42 7
Feb. 16, 1861	54 9	38 11	23 0	35 7	40 0	44 7
Feb. 23, 1861	54 0	39 4	23 3	35 5	39 7	41 1
March 2, 1861	54 2	39 2	23 0	35 1	39 7	41 7
March 9, 1861	54 2	38 11	23 6	34 6	41 8	43 8
March 16, 1861	53 8	38 7	23 9	34 10	40 1	41 0
Aggregate Average	54 2	39 1	23 2	35 3	40 1	42 5
Same time last year	44 5	35 9	22 6	32 4	39 0	36 11

PRICES OF SEEDS.

BRITISH SEEDS.

MUSTARDSEED, per bush., brown	11s. to 15s.
CORIANDER, per cwt.	14s. 16s.
CANARY, per qr.	50s. 58s.
TREFOIL	24s. 30s.
TARES, winter, new, per bushel	10s. —s.
LINSEED, per qr., sowing —s. to 74s. crushing.	58s. to 60s.
LINSEED CAKES, per ton.	£9 10s. to £10 10s.
RAPESEED, per qr.	70s. to 76s.
RAPE CAKE, per ton.	£5 10s. to £6 0s.

HOP MARKET.

Mid and East Kents.	80s., 140s., 200s.
Weald of Kents.	60s., 120s., 165s.
Sussex	60s., 80s., 126s.
Yearlings	80s., 120s., 170s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

Yorkshire Flukes	120s. to 140s. per ton.
Lincolnshire Regents	100s. to 110s. "
Dunbar red soil do.	140s. to 160s. "
Ditto, ditto, reds	105s. to 120s. "
North Berwick Regents	120s. to 125s. "
Perth, Forfar, and Fife do.	90s. to 110s. "
Ditto, do. do. Rocks	80s. to 90s. "
Ditto, do. do. Reds	75s. to 80s. "
French Whites	60s. to 90s. "
Belgian do.	60s. to 80s. "
Dutch do.	60s. to 80s. "

BOROUGH AND SPITALFIELDS.

	Per Ton.
York Flukes.	130s. to 150s.
Scotch Regents.	110s. to 130s.
Ditto Cups	75s. to 90s.
Ditto Rocks	90s. to 100s.
Dunbar Regents	160s. to 180s.
Other kinds	80s. to 100s.

WOOL MARKETS.

ENGLISH WOOL MARKET.

Per sack of 240 lbs.

Fleeces—Southdown Hogs	£18 0 to £18 10
Do. Half-bred Hogs	19 0 19 10
Do. Kent	17 10 18 10
Do. Southdown Ewes & Wethers 17 0 17 10	
Do. Leicester do.	17 0 17 10
Sorts—Clothing, picklock.	19 10 20 0
Do. Prime and picklock.	18 0 19 0
Do. Choice	17 0 17 10
Do. Super	15 0 16 0
Do. Combing—Wethermatching.	19 0 20 0
Do. Picklock	17 0 18 0
Do. Common	16 0 0 0
Do. Hog-matching.	21 0 22 0
Do. Picklock matching	17 0 18 0
Do. Super do.	16 0 0 0

LIVERPOOL WOOL MARKET, MARCH 23.

	s. d.	s. d.
Laid Highland Wool per 24lbs.	11 6 to 13 0	
White Highland do	13 9	17 0
Laid Crossed do..unwashed	14 6	16 6
Do. do..washed	16 0	18 6
Laid Cheviot do..unwashed....	18 0	22 0
Do. do..washed	22 0	28 0
White Cheviot do..washed.....	34 0	42 0

FOREIGN AND COLONIAL WOOL MARKET.

	Per lb.	s. d.	s. d.
German, { 1st and Elect.	3 4 to 4 6		
Saxon, { Prima	2 4 3 0		
and { Secunda	2 0 2 4		
Prussian. { Tertia	1 8 1 10		
COLONIAL—SYDNEY—Lams.	1 2 2 3		
Scoured do.	1 4 2 3 1		
Unwashed	0 9 2 1 1		
Locks and Pieces.	0 9 2 1 8		
Slips and Skin	0 11 1 8 2		
PORT PHILIP—Lams.	1 2 2 7		
Scoured do.	1 2 2 2		
Unwashed	0 8 2 1 0		
Locks and Pieces.	0 6 1 9		
S. AUSTRALIAN—Lams.	1 6 2 2 0		
Scoured do.	1 2 2 5 2		
Unwashed	0 8 2 1 2		
Locks and Pieces.	1 0 1 1		
V. D. LAND—Lams.	1 4 2 2 2		
Scoured do.	1 0 2 1 9 2		
Unwashed	0 0 1 6		
Locks and Pieces.	1 0 1 7 6		
CAPE OF GOOD HOPE—Fleeces.	0 7 1 11		
Lams.	0 10 2 0		
Scoured	1 0 2 1		
Unwashed	0 7 1 1		

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from importers' stores, £12 5s. to £12 15s. p.ton.
 Bones, £5 to £5 10s. per ton; ditto crushed, £5 5s. do; ditto dissolved, £6 10s. do; ditto half-inch 19s. to 19s. 6d. per qr.; ditto dust, 19s. to 20s.
 Animal Charcoal, (70 per cent. phosphate) £4 10s. to £5 per ton.
 Coprolite, Cambridge, in London, whole 32s. to 44s., ground 55s. to 58s.; Suffolk, whole 35s., ground 46s. to 47s. per ton.
 Nitrate of Soda, £13 10s. to £14 10s. Gypsum, 50s. per ton.
 Salt in London, according to quality, 25s. to 27s.
 Sulphate of Ammonia, £14 10s. to £15 per ton.
 Sulphuric Acid, concentrated 1-645 lb. per lb., brown 1-712 03d.
 Superphosphate of Lime, £5 10s. to £6 6s. per ton.
 Blood Manure, £5 5s. to £7 10s. per ton.
 Linsced Cake, best American, £11 12s. 6d. to £11 15s. (brl.), ditto £10 10s. to £11 (bag) per ton.
 Rape Cake, English £5 to £6 5s.; fine German green, £6 10s. to £6 15s. per ton. Cottonseed Cake, £5 10s. to £6 15s. per ton.
 Marseilles Cake, £9 12s. 6d. to £10 per ton.

E. PURSER,

London Manure Company, 116, Fenchurch Street, E.C.

LIVERPOOL GUANO AND SEED, &c., MARKET.

Guano, Peruvian, £12 00 to £13 00	Linsced Cake per ton—
Do. Upper do. 6 00 6 10 00	American, bags £10 15 0 to 11 0 0
Ichaboe, per ton 0 00 0 00	Marseilles none 10 00 10 5 0
Patagonian 2 00 3 10 00	English 10 10 0 11 0 0
Saldanha Bay 4 00 5 00	Cotswold, decor. 5 15 0 7 5 0
Kooria Moorina 3 17 6 4 5 0	Locust Beans p.ton 6 00 7 0 0
Sulphate of Am. 14 00 15 00	Brimstone, 2d & 3rd 7 12 6 8 0 0
Bone Ash 4 15 0 5 5 0	Nitr. of Soda, p.ct. 0 12 3 0 13 0
Cloveseared, American, 2 00 2 6 0	Linsd. Bomby, p.ct. 2 15 0 2 16 0
red, new, per cwt 2 00 2 6 0	Tallow, 1st E.C. 2 15 0 2 19 0

SAMUEL DOWNES, General Broker,

Exchange Court, Liverpool.

AGRICULTURAL MEETINGS IN 1861.

APRIL 2, 3, 4, AND 5.—Royal Dublin Society.—Spring Cattle Show in the Agricultural Hall, Dublin. Entries closed. Superintendent, Mr. A. Corrigan, Kildare-street, Dublin.
 MAY 22.—Royal Agricultural Society of England.—Half-yearly General Meeting, at the Society's House in Hanover Square.
 MAY 22.—Smithfield Club.—Half-yearly General Meeting at the Freemason's Tavern.
 JUNE 5, 6, AND 7.—Bath and West of England Society.—Meeting at Truro. Entries close for Implements, April 1; for Stock, April 5. Secretary, Mr. St. John Maule, Pulteney Street, Bath.
 JUNE 12.—Oxfordshire and Banbury Agricultural Society.—Meeting at Oxford. Secretary, Mr. T. Pileman, Oxford.
 JUNE 19.—Norfolk Agricultural Association.—Meeting at Swaffham. Entries close June 1. Secretary, Mr. E. C. Bailey, Orford Street, Norwich.
 JUNE 25.—Essex Agricultural Association.—Meeting at Romford. Entries close June 1. Secretary, Mr. H. Emson, Slough, Halesstead.
 JULY 5.—Suffolk Agricultural Association.—Meeting at Ipswich. Entries close June 10. Secretary, Mr. R. Bond, Ipswich.
 JULY 15, 16, 17, 18, AND 19.—Royal Agricultural Society of England.—Meeting at Leeds. Entries close for Implements, May 1; for Stock, June 1. Secretary, Mr. H. Hall Dore, Hanover Square, London. (The Show of the Yorkshire Agricultural Society merges this year into that of the R. A. S.)
 JULY 23.—Durham Agricultural Society.—Meeting at Darlington. Entries close July 8. Secretary, Mr. R. C. Coulson, Burngill House, Durham.
 JULY 24.—Bridlington Agricultural Society.—Meeting at Bridlington. Entries close July 13. Secretary, Mr. C. Gray, Quay Road, Bridlington.
 JULY 25.—Driffield and East Riding Agricultural Society.—Meeting at Great Driffield. Entries close July 11. Secretary, Mr. R. Kirby, Driffield.
 JULY 30 AND 31, AND AUGUST 1 AND 2.—The Highland and Agricultural Society of Scotland.—Meeting at Perth. Entries close June 14. Secretary, Mr. J. Hall Maxwell, Albany Place, Edinburgh.
 JULY 31 AND AUGUST 1.—North Lincolnshire Agricultural Society.—Meeting at Brigg. Entries close July 13. Secretary, Mr. J. Hett, Brigg.
 AUGUST 7, 8, AND 9.—Royal Agricultural Improvement Society of Ireland.—Meeting at Belfast. Entries close July 8. Secretary, Mr. J. B. Thornhill, Upper Sackville Street, Dublin. (The Show of the North East Agricultural Society of Ireland merges this year into that of the R. A. S.)
 AUGUST 8.—Northumberland Agricultural Society.—Meeting at Newcastle-upon-Tyne. Entries close July 27. Secretary, Mr. W. Johnson, Trench Hall, Gateshead.
 AUGUST 15 AND 16.—Cleveland Agricultural Society. Meeting at Yarm. Entries close August 1. Secretary, Mr. T. Farrington, Northumbria, Middlesex.
 AUGUST 27 AND 28.—Kent Agricultural Society.—Meeting at Dartford. Entries close July 27. Secretary, Mr. C. J. Cooke, Middle Row, Maidstone.
 AUGUST 31.—Halifax and Calder Vale Agricultural Society.—Meeting at Halifax. Entries close August 17. Secretary, Mr. W. Irvine, Otenden, Halifax.
 SEPTEMBER.—Keighley Agricultural Society. Meeting at Keighley. Secretary, Mr. E. Fawcett, Keighley.
 SEPTEMBER 4 AND 5.—North Lancashire Agricultural Society.—Meeting at Chorley. Entries close August 21. Secretary, Mr. G. Hunt, Preston.
 SEPTEMBER 10.—North Lonsdale Agricultural Society.—Meeting at Ulverston. Entries close September 6. Secretaries, Messrs. Postlethwaite, Ulverston.
 SEPTEMBER 11.—Spargenhoe Farmers' Club.—Meeting at Market Bosworth. Entries close August 14. Secretary, Mr. T. Davenport, Ashby-de-la-Zouch.
 SEPTEMBER 11 AND 12.—Manchester and Liverpool Agricultural Society.—Meeting at Ashton-under-Lyne. Entries close August 14. Secretary, Mr. T. B. Ryder, Elliott Street, Liverpool.

SEPTEMBER.—German Landowners' Society.—Meeting at Schwerin, Mecklenburg.
 SEPTEMBER 19.—Waterford Farming Society.—Meeting at Waterford. Entries close September 1. Secretary, Mr. B. H. Dyer, Beau Street, Waterford.
 SEPTEMBER 19 AND 20.—Staffordshire Agricultural Society.—Meeting at Wolverhampton. Entries close August 24. Secretary, Mr. W. G. Newstead, Newstead-under-Lynny.
 SEPTEMBER 26.—Gloucester Agricultural Society.—Meeting at Cirencester. Entries close August 20. Secretary, Mr. E. Trinder, Cirencester.
 SEPTEMBER 26.—Northamptonshire Agricultural Society.—Meeting at Northampton. Entries close September 10. Secretary, Mr. P. M. Gue, Rothwell, Kettering.
 SEPTEMBER 27.—Ludlow Agricultural Society (and Sheep Fair) at Ludlow. Entries close September 2. Secretary, Mr. T. Weyman, Ludlow.
 SEPTEMBER 28.—Ballinasloe Agricultural Society.—Meeting at Ballinasloe. Entries close September 21. Secretary, Captain Gascoyne, Mackney, Ballinasloe.
 OCTOBER.—Sleaford Agricultural Society.—Meeting at Sleaford. Secretary, Mr. J. Bellamy, Sleaford.
 OCTOBER 4.—Herefordshire Agricultural Society.—Meeting at Lutton. Entries close September 16. Secretary, Mr. T. W. Turnley, Bedford.
 OCTOBER 15.—Herefordshire Agricultural Society.—Meeting at Hereford. Entries close September 14. Secretary, Mr. J. Owen Fowler, Hereford.
 NOVEMBER 28.—Rugby and Dunchurch Agricultural Society.—Meeting at Rugby. Entries close November 12. Secretaries, Messrs. W. and E. Harris, Rugby.
 NOVEMBER 28.—Rutland Agricultural Society.—Meeting at Oakham. Entries close November 4. Secretary, Mr. W. C. Morris, Oakham.
 DECEMBER 2, 3, 4, AND 5.—Birmingham Cattle and Poultry Show, in Bingley Hall, Birmingham. Entries close November 1. Secretary, Mr. J. B. Lythall, Temple Street, Birmingham.
 DECEMBER 9, 10, AND 11.—Yorkshire Exhibition of Fat Stock and Poultry, at York. Entries close November 21. Secretary, Mr. J. Watson, York.
 DECEMBER 10, 11, 12, AND 13.—Smithfield Club Fat Cattle Show, in the Baker Street Bazaar, London. Entries close Nov. 1. Secretary, Mr. Brendreth Gibbs, Half-Moon Street, Piccadilly, London.
 DECEMBER.—Royal Dublin Winter Fat Cattle Show, in Dublin. Superintendent, Mr. A. Corrigan, Kildare Street, Dublin.
 DECEMBER.—Northern Counties Fat Cattle and Poultry Show, at Darlington. Secretary, Mr. J. Hodgson.
 * * On the first Monday in every month from February up to June, and recommencing in November, there is a Discussion Meeting of the Central Farmers' Club, at 39, New Bridge-street, Blackfriars, at half-past five o'clock. On the first Wednesday in every month—excepting January, September, and October—there is a Council Meeting, confined to Members of Council and Governors of the Royal Agricultural Society, in Hanover-square, at twelve o'clock; and on every other Wednesday, from February to July, an open Meeting for all Members of the Society, at twelve o'clock.
 [We shall continue the occasional insertion of this List throughout the year, and add to it as other Societies make their arrangements, of which we shall be obliged by early notice.—EDITOR M.L.E.]

DR. CURTIS'S MEDICAL WORK, "MANHOOD."

An Essay on Nervous and Generative Diseases.

Just Published, the 130th Thousand, with numerous plates, in a sealed envelope, price 1s. Sent by all Booksellers, or sent, post-paid, by the Author, for 12 stamps.

MANHOOD: THE CAUSE AND CURE OF PREMATURE DECLINE, with Plain Directions for Perfect Restoration to Health and Vigour. By Dr. J. L. CURTIS, 15, Albemarle-street, Piccadilly, London.

CONTENTS:

Introductory Chapter.—On the Physiological Structure and Functions of the Reproductive Organs.

Chapter II.—Causes of Spermatorrhoea and Impotence; Early Vicious Indulgences; Dangers of Neglect.

Chapter III.—A Review of the various Disqualifications of Marriage, whether resulting from the Youthful Abuse, the Follies of Maturity, the Effects of Climate, or Infection.

Chapter IV.—The Author's plan of Treatment, Medical and Moral, with observations on a new and successful mode of detecting Spermatorrhoea and other Urethral discharges by microscopic examination.

Chapters V. and VI.—On the modern Treatment of Gonorrhoea and Syphilis.

The Book concludes with numerous varied and interesting cases, to which is added the Author's receipt of a preventive Lotion.

REVIEWS OF THE WORK.

"Curtis on Manhood.—This is a truly valuable work, and should be in the hands of young and old."—*Sunday Times*, 23rd March, 1856.

"The author has conferred a great boon by publishing this little work, in which is described the source of those diseases which produce decline in youth, or more frequently, premature old age."—*Daily Telegraph*, March 27, 1856.

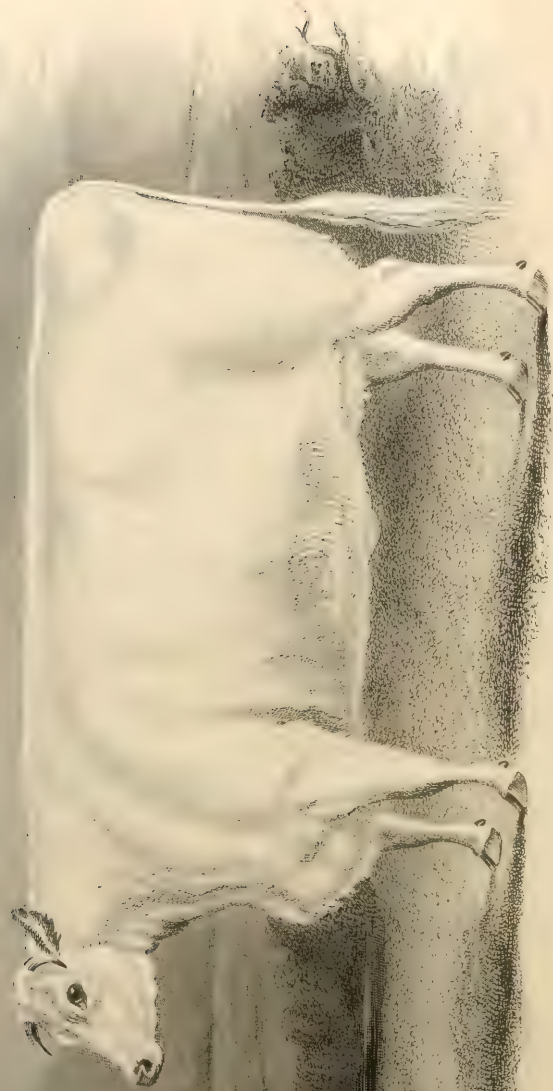
"We feel no hesitation in saying that there is no member of society by whom the book will not be found useful, whether such person held the relation of a parent, preceptor, or clergyman."—*Sun*, Evening Paper.

N.B.—At home for consultation daily 10 till 3 and 6 till 8, Sunday 10 till 2.

Agents for the work, Allen and Co., 20, Warwick Lane; Mann, 59, Cornhill, London.



Painting of a horse
by J. H. B. 1850



THE FARMER'S MAGAZINE.

MAY, 1861.

PLATE I.

GEMMA DI VERGY,

AND THE BEAUTIES OF MAMHEAD.

The beauties of Mamhead are susceptible of an infinite variety of interpretation. The House—the Grounds—the Church—the Gardens—the view from here, and the quiet nook there—have each their own peculiar charm and attraction. One pilgrim will seek the upland path that leads him to the famous yew-tree in which the parson found a pulpit, and under it his congregation due shelter, while the pretty little kirk itself was repairing. Another would pause on his way before the hardy handsome ilex, rejoicing as when we saw them in the welcome sunshine of a spring morning. The more courteous visitor might make his first call at the mansion, and command “the situation” at a glance, as new beauties broke upon him at every turn—the lovely landscape lying before him, stretching on to Exmouth in the distance, and promising more and more for the yet unravelled riches of Devon. The very drive through the tall straight firs, as they throw their solemn shade athwart you, is something to remember, and at the moment something more to suggest. The Pines, the Oaks, the Elms, grandly though they grow, have still scarcely the glory of the Magnolia terrace; never, perhaps, in more matured splendour than during only last autumn. But we come alas! in a few short months’ time to be only too late. The terrible winter, that spent its force in vain against the wiry highlander and stalwart evergreen, wreaked all his vengeance on the petted pride of the nursery, and left that wondrous walk a dry shattered ruin of dead sticks. Quickly and discreetly does their hapless guardian turn us away to a pineapple that he really hopes to ripen “by Tuesday,” and with better heart does he talk of a flower or two of orange blossom that he is jealously keeping for the same eventful day. And so we stroll on through vineries and conservatories, till we reach once more the undulating open, and echo, with the Goth of a husband, “Well, Polly, it may be picturesque enough, but I should like to know how the deuce you are to ride over it!”

And are these the beauties of Mamhead? Was it for this we turned our gaze from Powderham, when we stopped, like the first swallow of the sea-

son, at the little Star-cross station? Shall we go armed like sturdy tourist with handy book and curious pack, to “do” the home of Sir Lydston? Shall we wander on from hill to dale, through darkening ride or winding path, a sight-seeing stranger out for a holiday? Nay! hold thy hand, good driver! draw rein in this hollow; for we care not to go further. Our guide-book is a *sheet-calendar*, the most beautiful “bit” in all yon domain a loose box with a race-horse inside it; while as to botany, if you will have it, all our knowledge of the science turns to a plant brought from Melbourne, and grafted on to the Sweet-pea. We are told it flourishes hereabouts; though those conventional cockneys talk of nothing, when they get back, but the yew, and the ilex, and the Exe—as if they had ever seen the beauties of Mamhead!

But we will, if you please, Mr. M’Kairnan; for, like the clod when he went to be married, we came “a’ purpose.” And so we step out at the Stud farm, and in the next minute or so we are by the side of Masaniello, a horse Sir Lydston very handsomely gives his tenantry the service of. He is by The Hero out of Ignorance, the dam of Ignoramus, by The Little Known; and it is not much to say of him, that he is a great deal better-looking than his sire—the meanest, most “hackish” good race-horse we almost ever remember. The son takes after him in colour, and is in some other points a flattering likeness of his father, but he gets size and substance from the dam, and promises to fill out and furnish into a useful country stallion. Still, this was scarcely what we came out to see, though we hesitate ere we dare pass the threshold of the companion-box. For here, as we feel, too surely shall we find the *equo ne credite*, Teucri—the *donum exitiale Minervæ*—the fatal horse, that so far would seem to have had a kind of curse hanging over his fortunes. His breeder yet lives and thrives, as we trust his present owner long may. Let us then say that Gemma di Vergy enjoys a peaceful home at last in that sweet sheltered vale; but what an eventful life has it been between those two eras of his birth at Olton, and his manhood at Mamhead! When the murderer Palmer was

awaiting his trial and his fate, his thoughts centred far more on "the Lurley colt" than himself:—

"Let me but see my favourite fancy win,
Once more behold the public taken in,
And then content I die."

But—

"'Forbear,' stern Death replies,
'No more oppose irrevocable fate,
Impatient Satan claims his intimate.'"

And the Lurley colt was knocked down at the sale of Palmer's horses in January, 1856, for 105 gs., at which price he went into Joseph Dawson's stable. There was no registry of fictions names in those times, and Gemma di Vergy ran through his first season and on afterwards as Mr. Bond's, Mr. Hope's, Mr. Robson's, Mr. Woodhall's, or Mr. Craven's. However, let it be under any title that might, the cloud still hung over him, Mr. Charley Coghlan having the common credit of being the horse's owner. A bill of sale, a burst of tears, and a scene or two in the Insolvent Court severed this connection, and after being hawked about at Tattersall's, Gemma di Vergy became the property of Lord Waterford at 800 gs. Need we say how soon afterwards the poor Marquis broke his neck from a fall when coming home with his hounds, or dwell on the sale at Curraghmore? Here the great horse of the catalogue was knocked down at £1050 to Mr. Hamilton of Roundwood, who went out of his mind almost immediately afterwards; while the death of Mr. Turner, the auctioneer, followed as shortly, and Gemma di Vergy passed by other agency into the hands of Sir Lydston Newman for 1010 gs. The paddocks at Mamhead were not then built, and the son of Sir Hercules stood for his first season at Stockwell, whence he was removed just in time, as difficulties and distrainers came to baunt the long-cherished home of the old stockinger. The death-warrant—the bill of sale—the fatal accident—the raving madman, or the man in possession—where shall we lay the scene? In Newgate, the Insolvent Court, or the lunatic asylum? Rather let us draw the curtain over these harsh memories, and pour-tray Gemma di Vergy as when we last saw him blooming in his box in the happy valley. The spell of the cruel Fairy is broken at last. Fly she must from such a promised land as this, as the Good Genius of the sylvan scene waves her wand over the brown horse's head, telling him of better times, of gallant sons and graceful daughters, that shall build for him a fairer fame and a more honourable reward.

Never had a really good horse so poor a chance as Gemma di Vergy. From the day he was put into work, to the time he was taken out of it, he was continually in difficulties, and his repute as a race-horse can never be judged by his performances, good as even some of these were. Luckily, however, he has not felt his misfortunes, and now at seven years old he is one of the very handsomest horses in England. Standing something over sixteen hands, he is so beautifully proportioned, so well put together, and so thoroughly furnished, as to give one more the idea of "a big little horse," than one reaching to his actual height. But this is the case with all animals of anything like perfect

symmetry, and Gemma di Vergy is very near perfection. He begins admirably with that great test in any scale of points, a handsome, clean, bloodlike head—taking a deal after that of his sire—with a kindly expression of the eye that tells truly enough of his excellent temper. He has a fine well-laid shoulder, with rare girth, measuring six feet four inches and a half, and good round barrel. But better still are his broad back and slashing quarters, so "bloody" and yet so powerful, running into strong muscular thighs, and capital clean hocks and legs. He has plenty of bone, taking nearly nine inches round below the knee; while he has long, racing, elastic pasterns, beautifully fitted into a good wholesome foot. Had his tail been only set on an inch or so higher, Gemma di Vergy might have boasted of the finest quarters of any horse alive, and as it is, there can be few to beat him. Indeed, as a thoroughbred horse calculated to get "the sound and stout" we do not know his superior, and if he were ours he should certainly go for the Royal hundred at Leeds. His temper here would be still in his favour, in travelling, and on the Show ground. If anything, he only walked out of his box a little too calmly, though, as we shall have to show hereafter, he has plenty of courage in the stud, and his produce tell such a story as hardly any other young stallion can own to. Gemma di Vergy, however, like many of the most amiable of us, has his peculiarities, and he is evidently a restless horse when left to himself. He lives, in fact, in a padded box, and is said at one time to have been an inveterate weaver, a trick of which he was cured by continually supplying him with sacks stuffed with litter. He amused himself by pulling these to pieces, and being so employed forgot the habit that so many high-conditioned horses, like the sham-sick lady at Bath with the waters, take to in "mere wantonness." Gemma di Vergy's restlessness, however, may be traced back in the family. Wanderer, the sire of Peri his grandam, was always on the move, or in some mischief or other. He would carry the clean straw out of his box into the yard, and turn on the cock that let the water into his trough with his teeth, and so overflow the whole place. When Nimrod saw him at Petworth, "he had not been known to lie down in his box for six years," but as the same celebrated writer adds, "he was one of the finest animals of his kind, and a capital racer at high weights and long distances, and the sire and grand-sire of several good race-horses. In fact, he was exactly the sort of horse that England ought to have to perpetuate the good properties of the animal, and for other purposes than racing." This was written of Wanderer more than twenty years ago; but this is "just the sort of horse" we are crying out for now. His grandson is another of just the sort, and if Sir Lydston Newman will take our advice, he will enter Gemma di Vergy for the Royal Agricultural Society's premium at Leeds in July next.

So much for good looks. Let us now go on to prove Gemma di Vergy one of the best-bred horses in the Stud Book. He was bred by Mr. Richard Taylor, than of Olton House, near Solihull, but now of Manuel Hall, King's Norton, near Bir-

mingham. Foaled in 1854, he was got by Sir Hercules, out of Snowdrop, by Heron, her dam Fairy, by Filho da Pata, out of Britannia, by Orville.

Sir Hercules, born in Ireland in 1827, was by Whalebone, out of Peri, by Wanderer, her dam Thalestris, by Alexander, out of Rival, by Sir Peter. Like his son, Sir Hercules never had fair play as a race-horse, and there is little doubt but that he was made safe for the St. Leger, though he still ran third in a field of nineteen to such good horses as Rowton and Voltaire. But it is as a stallion that Sir Hercules is especially famous, and well do we remember when old Weatherley (by no means to be confounded with the Messrs. Weatherley) was descanting over his budding honours. When we saw the hope of the family, the then home-trained Coronation, win his maiden race at Oxford, and a brown filly hauling away at "the Vicar," in a lilac jacket and red sleeves, we were wont to watch with all the eager anxiety of hope and youth. And the promise duly developed with the Hydra, the Corsair, Cruisken, Birdcatcher, Faugh-a-Ballagh, Hyllus, Robert de Gorham, that wonderful horse over a country, Discount, and no end of an *et cetera* in England and Ireland—Gunboat and Gemma di Vergy being the two strongest props of his old age. Sir Hercules died in 1855.

Snowdrop, bred by Mr. Fowler in 1843, never ran, having met with an accident when in training; nor, with the exception of Lurley and Gemma di Vergy, have any of her numerous family done very much upon the turf. She dropped a colt foal this spring to Stockwell, that died when two days old; and the mare has since been served by Ethelbert. She is still in the possession of Mr. Taylor, who sold Gemma di Vergy, a few days after he was dropped, to Palmer for 200 gs., the latter at the same time entering into an agreement to take all the mare's produce. Although now quite a dowager, Snowdrop is said to be looking wonderfully fresh and well.

Whalebone—and Orville—Sir Peter—and Heron, a son of Buzzard, by Castrel—the more we study Gemma di Vergy's pedigree, the more we like the good staying blood in it, while he himself was a rare game horse, with a fine turn of speed to back his stoutness. But it is not as a race-horse that Gemma di Vergy's name will live, for in our mind's eye he has already proved his worth as a stallion. Never have we seen such a lot of foals by the same horse as we did in our morning stroll through the Mamhead Paddocks a week or two since. There was no need of McKairnan at our elbow, for you could mark down every one of them. Let the mare be what she might, the produce came with the same good lean head and brown muzzle, the grand quarters, fine thighs, and big clean hocks. In fact, so far they all throw to him; while the chief anxiety at the time of our visit was as to what would come from Prioress, with her time nearly up, or over. This game bit of stuff is now dropping a little to her leg, but in other respects she has the same wiry, over-worked look as when in training. The two other mares purchased by Mr. Lydston of Mr. Ten Broeck have foaled—The

Belle, a filly already christened "The Belle of the Season," and Olympias, a colt. They are great, fine, roomy mares; but the young people are striking likenesses of their sire, and it is hard to choose between them, they are both so good. Like another Pharaoh, Mr. Ten Broeck by the conditions of the deal claims them as "the first-born," and we can well congratulate him on his bargain. Then Madame Clicquot, another great banging mare, whose short pasterns hardly answer for the speed she showed, has a foal with all the Sir Hercules points, and especially noticeable for its immense bone; while Botany, herself the best-looking dame of the Haras, has thrown such a filly as is alone well worth the journey down, or up afterwards to the Brick House Farm. Such style and such power—the bloodlike head—the fine shoulders—and again and again, ever better still the next time you see them—those rare quarters, thighs, and hocks. Her action, too, is superb, and barring accidents this filly must grow into "something." Great care, however, is necessary, for the mare is very wild, and, when we saw her, could not be trusted out of her box or the farmyard. We, though, have more liberty, and so let us get back again to those fresh well-watered paddocks where the grass comes green and thick when it will not grow even in other parts hereabouts, where the tall firs have been turned to "available" purposes in building the best of sheds and boxes, and where in one short revolving year a really perfect breeding establishment has been completed and furnished. The mares, now numbering somewhere about twenty-five, include, beyond those already referred to, a Teddington mare out of Canary by Birdcatcher, with a filly at her foot; the blind Deceptive, by Venison, the dam of Weatherbound, with a colt foal, a little "off" when we saw him; a great powerful Melbourne mare, better known as Ralpho's dam, with a colt taking all after the horse, and consequently with far more style than the mother; and Columbine, a coarsish cross-bred Irish mare, with a very fine filly that luckily again bears strongly the imprimatur of Gemma di Vergy, who answers for the produce of the four. Then, by right of seniority, there should come Repartee (the dam of Bon-mot), now nineteen years old, with her sweet head and bloodlike character; but, unfortunately, she broke last season to the brown, and her foal is by Masaniello. Little Marie Wilton has also thrown her first foal to the chesnut horse, and it is only fair to say that he promises to be better than either of his parents. A very good-looking mare, Petticoat, by Pantaloon out of Rifleman's dam, bought in Ireland last summer, has missed to Artillery; but she has a yearling by the same horse, that, if not fit for better things, is of the very stamp of a first-flight Leicestershire hunter. The neat Sneer has a colt by King Tom, bearing about him a strong taste of the Harkaway; and the yet "prettier" Medal, a clever colt to Loup Garou; while Comedy's ever breeding begins to look hopeless, and Lady Blanche, by Epirus, has unluckily slipped her foal to Gemma di Vergy. Mainstay has had an accident, and we did not see her; and Margaret, an "odd" lot, "away on the hill," was scarcely worth

ferreting out. In the more recent purchases are Hurry Scurry (Precursor's dam); Carlotta, by Orlando; and Lady Audrey, by Pantaloon; and taking the test by what we saw, there are very few even middling ones amongst them. The grey Irish mare lacks style, going back as she does to the "coach-horse" Tarrare; Marie Wilton wants size; and old Margaret, about worn out when picked up in the neighbourhood, can hardly keep company with such noble dames as Botany, Madame Clicquot (whose name has been injudiciously changed to Forget-me-not), The Belle, Olympias, Repartee, Mainbrace, Prioress, and Petticoat. The produce of these mares will show such a sample of yearlings by next spring as perhaps no other young stud of the same standing has ever been able to offer.

As it is, a lot of eight yearlings will come this season to Tattersall's on the Monday after the Derby; but the world must by no means judge by these of what the Mamhead stud can or will do. The pride of them, however, is a fine long-striding filly, Lurline, by Gemma di Vergy, out of Repartee; not quite so like the horse as many of the foals, but still with the clean head, good back, and great square hocks, and rare liberty in her action. Grouped with her in the same paddock were three other fillies—the pick, Devoniensis, by Fandango, out of the Melbourne mare, a little short, but wonderfully like her sire, and with a deal of substance; while she has the further credit of being an own sister to the flying Ballerino, a fact that is sure to tell at the hammer. Then, side by side with her, was the Gardener's Daughter, by Teddington, out of Botany, a stylish filly that has not been doing quite so well as the others; and Quickstep, a Vandyke filly, out of the Teddington mare. There is another plainish colt out of Madame Clicquot, by Vandyke, the first stallion Sir Lydston ever had, and that unluckily, or luckily, broke his leg a season or two since. He was a Flying Dutchman horse; and the Days made some fuss over him at Ascot, when the sweet-going Sedbury drew away from them over the New Mile. A Sweetmeat colt, called Newfoundland, out of an own sister to Promised Land, both from his pedigree and his appearance should make money, for he is a fine-topped, blood-like-looking colt; but the "gem" of this year's "entry," in the way of good looks, is "The Count;" although, say it we must, but the model of a handsome park hack; while he, no doubt, gets much of this fashion from his sire, Count Batthyany's Arab. As a set off to him, the grey steepchase mare has a curious-coloured colt by Cannobie, with one of the sourest heads we ever saw; and it is extraordinary to note how much Gemma di Vergy has improved upon it in the handsome filly foal the same mare has now by him. It will be gathered that, on the whole, we do not estimate the Mamhead yearlings of 'sixty-one so very highly; and, indeed, we question whether there should have been any set sale at all this season. The stud had not got into fair working order, and but little proof will come of it of what such a horse as Gemma di Vergy will do for it. The taste of him, however, has already been enough, and his subscription is full, the Royal stud send-

ing two mares, one of which, The Deformed, has now a yearling filly to him, very highly spoken of.

And now we really must go, despite the old Captain and the two thorough-bred mares he is sending to Masaniello, or the caution he is quoting over Mat Dawson's Lord of the Isles colt—the flashiest young gentleman, with his light coat and his white heels, in all these parts, where a much more sober fashion is running on brown muzzles and black legs. Only hark to what the Captain has to say of him!

"Four white feet—sell him soon away;
Three white feet—keep him not a day;
Two white feet—swap him to a friend;
One white foot—keep him to his end."

But they will make tourists of us, after all; although really, my friend, we know Devonshire very well as it is—have dawdled away a day at Dawlish—have lounged over the Strand at Teignmouth—tried hard to breathe, walk, and talk at Torquay, and drawn the Hoe at Plymouth. But still in South Devon, further south, and a little more off the line, Sir Lydston, we hear, has another seat, as famous in its way for its site and its beauties. And we wake up in a moment—What! another Gemma di Vergy? More Botany to study, and other American plants to look at? Let us go, by all manner of means. And we 'scape Dawlish, Newton, and Totnes, to be embarked by the next morning on the ever-sacred waters of Slapton Lea—that sweet home of the wild fowl, where the duck breed, the moor-hen dive, and the teal in all immunity sail lazily round the ever-quivering float of the fisherman. Where the perch fairly tire your arm out, and pike as long and strong as shark go for speed in their set-to with the lusty troller. Where, at the Sands Hotel, Mr. Rolfe's sketches hold high places, and grateful visitors testify in every variety of mood and metre, how

"As they took their cup of tea
They sung the praise of Slapton Lea;

Or,

O'er their glass of eau-de-vie
Tell all they did in Slapton Lea."

As, again,

"The pounds of fish they all had collared,
And how they fared with Mr. Pollard—
What lots of lush and prog they swaller'd
Under the roof of Mr. Pollard."

And so on. But there is a smack of other beauties more after our own hearts, even in this cozy retreat of the jolly angler, and very hot-house of the privileged hunter. The young farmer who makes believe he is going to show us a long-wool comes accidentally across a Metal two-year-old; and there are rumours that, though Sir Lydston may not be down till the Autumn, "the great Handicapper," as they reverently speak of him, is come into the neighbourhood. Then, with a kindness and courtesy, for which we cannot be too grateful, Sir Henry Seale draws banks and braes full of thick lying—of the primrose and the violet—with the hope of finding us a fox. But bold reynard alone is unkind, and we must so be content with a glance over the gallant master's small wiry sort of hound—the very thing for the country—and a hear-say

history of the run they had the other day with their afternoon fox, who went right on to the moor, and was pulled down handsomely in the evening, but with no one near to worry him save a keeper that "see'em coming," and none else to tell the tale but "TALLY-HO," who went as far as he could, and dreamed the rest. And here, by the old Roman camp, we lose the last flush of "the red coats," as they draw from home in the gay sunshine with the mechanical method of men and hounds who have made up their minds for a blank day, and are only threading the primroses as a mere matter of form. But we will find yet, though, and are soon hard on the line of the handicapper, who has been viewed away towards Dorsley, his point being evidently for Cholwell. A holloa here says he has "not been gone ten minutes;" but it is getting late, and if he *did* face the moor, we might think with "TALLY-HO!" of what is to become of us? So we end as we began, in studying that noblest of animals, the thorough-bred horse; and Mr. Watson parades Hungerford, still looking, as the housemaid said of her sweetheart, "quite the gentleman," and as neat and has shapely as when we last saw him run for the Ep-

som cup. His pedigree, by John o'Groat, out of a Sadler mare, is a capital nick of speed and stoutness, while Hungerford himself could last and "wear" for ever. We never saw a horse who has done so much that shows so little mark of it. With him there stands old Vulcan, an established favourite with the Devonshire farmers; and Cleveland Shortlegs, wonderfully fresh and active, the best and *hardest* Cleveland that ever came South. These, though, are old acquaintances in the *Magazine*, and we can say but little more than "How d'ye do?" and "Good bye!" as we turn once more for town—thinking whether it were better to have spent those two glorious days amongst the "pubs," and "legs" at Epsom, or in the less exciting scenes of South Devon. An old friend of ours, a capital judge and a walking Stud Book, often said he would rather see his own young things at play in the paddock than the finest race that ever was run. This may be carrying the notion to the utmost, but there is an indescribable charm about the picture, as the grand old mare comes up to rub her nose on your arm by way of a welcome, and a Gemma di Vergy marches by, with all the air of the young hero that he is.

PLATE II.

FIDELITY; A PRIZE SHORTHORN HEIFER.

THE PROPERTY OF COLONEL TOWNELEY, OF TOWNELEY PARK, LANCASHIRE.

Fidelity, or Frederick's Fidelity, a white heifer bred by Colonel Towneley, was calved May 12th, 1857, and got by Frederick (11489), dam Vestris 3rd, by Valiant (12253), grandam Venilia, by Tom of Lincoln (8714), great grandam Venus, by Belierophon (3119), gr. gr. g. d. Verbena, by Renown (2525), gr. gr. g. d. Venus, by Tartar (2738), gr. gr. gr. gr. g. d. Miss Camidge, by Calton (1849), gr. gr. gr. gr. gr. g. d. Cornforth, by Pioneer (1321), gr. gr. gr. gr. g. d. Coy, by Marshal Beresford (4151), gr. gr. gr. gr. gr. gr. g. d. Cordelia, by Cecil (120), gr. gr. gr. gr. gr. gr. g. d. Cora, by Favourite (252), gr. gr. gr. gr. gr. gr. gr. g. d. Countess, by Cupid (177), gr. gr. gr. gr. gr. gr. gr. g. d. Lady, by Grandson of Bolingbroke (280), gr. gr. gr. gr. gr. gr. gr. g. d. Phoenix, by Foljambe (263), gr. gr. gr. gr. gr. gr. gr. g. d. Favourite, by Mr. R. Alcock's Bull (19).

Frederick, the sire of Fidelity, was bred by Colonel Towneley in February, 1849, and got by Duke (9032), dam Bessy, by Thickhock (6601), grandam Bampton Rose, by Expectation (1988). Frederick was never exhibited, but he has long since proved his value in the herd, as far away the best bull of his time. As we said, when we gave his portrait in September, 1858, "either for the prices they have made, or the prizes they have taken, the produce of no animal has ever equalled that of Frederick." Amongst his stock are Master Butterfly, Royal Butterfly, Roan Duchess the Second, Blanche the Sixth, Frederick the Second,

Ringlet, and other well-known animals. Although now in his thirteenth year, Frederick is so fresh that Mr. Thorn, the American buyer and breeder, was very anxious to take him out for use in his Thorndale herd.

Vestris 3rd, the dam of Fidelity, also bred by Colonel Towneley, is now just six years old. She dropped her first calf at two years and six days old, and won the first prize in the cow class in Paris within two months from that time. Since then she has had four more living calves, and is now three months gone with her sixth. The last, a heifer, was an own sister to Fidelity.

As a two-year-old heifer in calf, Fidelity, at the Warwick Meeting of the Royal Agricultural Society of England, took the first prize of £15, beating Mr. Francis Fowler's Daisy (the second prize), Colonel Towneley's Pearl (the third prize), and the following highly commended: Colonel Towneley's Emma, Mr. Marjoribanks' Vesta, and Mr. Douglas' The Lady of Athelstane; while Mr. Marjoribanks' Elegance, Captain Gunter's Moss Rose, and Mr. Bowly's Songstress were commended. As, in fact, was the whole class, and as we wrote at the time: "The strength of the shorthorns, and we might perhaps go on to say of the whole show, was in the two-year-old and yearling heifers. It is significant of their uniform goodness to note the award of the judges, who commended everything they saw here; but all the best men were here too—Booth, Colonel Towneley, Douglas of Athelstaneford, Stratton, Grundy, Captain Gunter, Marjoribanks, Noel Hill,

Sir Charles Tempest, and Jonas Webb, with comparatively new men, like Mr. Robinson of Clifton, and Mr. Fowler of Henlow." Our portrait of Fidelity was taken by Mr. Davis at this Meeting.

In the month following, at the Yorkshire Society's show at Hull, Fidelity took the first prize of £10 for two-year-old heifers in calf, beating the Colonel's Pearl (the second prize), and Captain Gunter's Moss Rose and Mr. T. R. Middleborough's heifer, both highly commended. In the same month, at the Meeting of the Royal Lancashire Society held at Blackburn, Fidelity took the first prize of £5 in her class and the silver medal as the best cow or heifer in all the entry. As a yearling heifer Fidelity was only commended at Chester, Mr. Booth's Queen of the Isles (first prize) and Colonel Towneley's Diadem (second prize) being both placed before her. However, the white heifer, as we have shown, had her revenge in the year following; Queen of the Isles not even being noticed at Warwick, where Fidelity won, an over-

sight that caused some sensation at the time. Not that many would have again given the Queen her Roodie rank; for Fidelity is a beautiful heifer, of a truly symmetrical deep frame and fine touch, with a really lovely head, and wonderfully good line along the back, while she is unquestionably far better behind than Mr. Booth's heifer. Fidelity had a fine healthy bull-calf in February, 1860, and is now in calf again.

The fame of the Towneley Herd is spread throughout the world, and very justly so too. With the careful culture of Mr. Culshaw, it has gradually got from good to better, until we may fairly now put it at its zenith. There is no stock sells so well; although with the tempting prices always to be had, the numbers still keep increasing. Since the commencement of this year eight bulls have been sold and two let; while from the 25th of November, 1860, to the 15th of March, 1861 there have been, singularly enough, *ten* calves dropped to replace them. Seven of these are heifers and three bulls.

SALT FOR MANGOLD-WURTZEL.

How few farmers know the use of salt! Its power to destroy and to revive we are alike unacquainted with.

Some years ago, being troubled on my grass-land with a weed which I could not eradicate by mechanical means, I sowed a heavy dose of salt, and at once effected the object. A season or two back, it struck me that if the experience was worth anything, it should teach me a quick way to rid my land of weeds generally—the arable land, I mean. The consequence was, that when the autumn arrived, the fields that were intended for fallow, received a very heavy coat of salt—coarse-grained, agricultural salt; which is, in fact, the sweepings from the salt-works, and the refuse of the pans. The quantity sowed was quite 12 cwt. The winter which followed was a severe one, and, in connection with the frost, the chemical action of the salt upon the soil was charming to the eye, which delights in the sight of a beautiful friable mould, in place of a churlish, unkindly clay, which usually resists the expansive and disintegrating glacial influence of winter. The field, too, on which the experiment was tried had long possessed a reputation for couch-grass, and that particular species of it known as water-grass, the most hopeless and troublesome of all. The hoe would not kill it; the twitch-rake would not gather it, and the children, in seeking it upon the surface after the harrows had left it exposed, usually secured half of it; and stamped the rest into the soil to perpetuate the kind. This water-grass, then, which the hoe would not kill, which the rakes could not collect, nor the children pick off, was quietly disposed of, never more to trouble me, while it lay at its winter repose. The salt had slain the thief of my profits, noiselessly as the ferret sucks the life-blood from the rabbit in its retreat; and when the first spring-furrow was turned, the view of the shrivelled

enemy—the enemy which had baffled all my ingenuity and kept my exchequer low—was cheering indeed. One length after another of the sinuous, wiry weed was examined, but there was no sign of life: not even at that critical point, the knot, could I detect, by means of the microscope, any indication of vitality. The "foal's foot," which runs down far into the substratum, were many of them dead, though not all. In looking round for the butter-cup roots, also, scarcely any were to be found: and glad I was; for bother enough they had been to me.

The land then received one or two furrows to incorporate the salt thoroughly, and diffuse its power beneficially, so that it might invigorate everywhere, and yet not remain in sufficient force in any one place to endanger the seed which followed.

At the proper season, and without any other preparation, the mangold seed was sown, and speedily vegetated. There were but few weeks to hoe, for the salt had attacked the principle of vitality in the seed of the annual, as it lay secreted in the clod, as well as that of the couch-grass, and the mangolds grew without let or hindrance to be a finer crop than ever before flourished upon the same plot of land. The foliage was thoroughly vigorous, and the bulbs were remarkably well matured and sound. The weight per acre reached 25 tons, when before the maximum had been 20 tons—by the aid of several loads of dung, and an immense amount of labour.

The following year, upon a field of the same character, I tried the same experiment, varying the course of management in some degree. I applied in October 12 cwt. of salt upon the upturned and weedy surface of that land destined for the root-crop, and allowed it there to lie and do its silent work as before, until, in February,

the soil was dry enough to allow of being worked. As in the first instance, the result perfectly justified the means. Together with the frosts of winter, the salt had performed wonders in breaking down the stubborn clods and compressed, livery furrow-slices. The soil was reduced to powder, and the weeds were generally dead, so that the mangold, which was planted in a finely pulverized seed-bed, had nothing to do but to grow without the rivalry of weeds—neither shaded by them from the sun, nor robbed by them of the nourishment purposely stored for their use. I said, however, that I introduced some change into my practice this second time. The change was as follows: Just after the last furrow was turned, I sowed 4 cwt. more salt, which I harrowed in before the seed was dibbled. The result proved the wisdom of the addition, I have reason to think—for the weeds were even fewer, the foliage of the mangold was finer, and the bulbs were larger than in the former case where the application of salt was merely made in the autumn.

It strikes me that our mangolds are freed also from another enemy by the use of salt. I mean insects. Slugs and wire-worm, both very destructive during certain seasons, are certainly banished by salt, if not killed.

Salt appears to be one of the cheapest and safest manures we can use. No soils naturally have too much of it, excepting perhaps those directly influenced by brine springs. One of its most valuable properties is its power to attract moisture. For this reason it may be sowed when the soil is perfectly dry, a condition fatal to so many manures, and will absorb the moisture from the atmosphere, and convey it to the root of the plant. Its principal office is to keep everything in the soil in a soluble state, and consequently in a state fit for the nourishment of vegetable life. Its benefit is not alone experienced by the root crop, but by the grain crop which follows, for its presence checks a redundancy of straw, and enables that straw to strengthen itself by assimilating from the soil the silica, of which, in certain combinations, it is a solvent.

I have tried the virtue of salt also for grass land, for wheat, and spring crops, and have arrived at curious results it may be well to publish at some future time. My object now, however, is to state the importance of salt for the coming mangold crop; and I shall be glad to know that my advocacy for its use has led any number of gentlemen to make a trial, which is sure to end to their satisfaction. F. R. S.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MONTHLY COUNCIL, *Wednesday, April 10th.*

Present—The Earl of Powis, President, in the Chair; Earl of Macclesfield, Lord Berners, Lord Leigh, Lord Tredegar, Lord Walsingham, Hon. W. G. Cavendish, M.P.; Hon. Colonel Hood, Hon. A. Vernon, Sir J. V. B. Johnstone, Bart., M.P.; Sir E. C. Kerrison, Bart., M.P.; Sir J. V. Shelley, Bart., M.P.; Mr. Raymond Barker, Mr. Bramston, M.P.; Mr. Caldwell, Colonel Challoner, Mr. Druce, Mr. Exall, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Wren Hoskyns, Mr. Howard, Mr. Lawrence, Mr. Milward, Mr. Paine, Mr. Pope, Mr. Sanday, Mr. Slaney, M.P.; Professor Simonds, Mr. Thompson, M.P.; Mr. Torr, Professor Voelcker, Mr. Jonas Webb, and Professor Wilson.

Six new Members were elected.

FINANCES.—The Hon. Col. Hood presented the report, from which it appeared that the Secretary's receipts during the past month had been examined by Messrs. Quilter and Ball, and found correct. The balance in the hands of the bankers on the 31st ult. was £4,075 3s. 1d., of which sum the committee recommended that £2,000 be invested in the New Three per Cents. The Quarterly Balance-sheet and Quarterly statement of subscriptions and arrears and of property were laid before the Council.

On the motion of Lord Berners, seconded by Lord Walsingham, the Right Hon. Lord Feversham was unanimously elected a Trustee in the room of his Grace the Duke of Sutherland, deceased.

Ed. Holland, Esq., M.P., was unanimously elected a

Member of Council, in the room of Lord Walsingham, elected a Vice-President.

The report of the Metropolitan Sites Committee was presented by the President, and after considerable discussion it was decided that its final consideration should be postponed to the Monthly Council in May.

VETERINARY.—Mr. T. Raymond Barker, Chairman, presented the report, which recommended the purchase of 12 sheep for the purpose of trying a medicine which had been invented by a French Veterinary Surgeon at Gavely, in France, for the cure of "cachexie" or rot, of which medicine a supply had been sent for experiment. This portion of the report was adopted; the remainder respecting the Veterinary Privileges of Members was negatived.

GENERAL LEEDS.—Lord Walsingham, Chairman, presented the report, which stated that land for the trial of Steam Cultivators had been secured about half a mile from the Garforth Station, on the Leeds and Selby branch of the North Eastern Railway, about six miles from Leeds, and the same distance from Milford Junction. The trials will begin on Tuesday, July 2, and the prizes will be adjudged at the Leeds Meeting. Arrangements were being carried out for the exhibition of the entire horses, for which purpose a curved form would be given to one end of the Show-yard.

The Bye-Laws and Resolutions of Council had been printed and were taken into consideration, their final adoption being deferred till May.

On the motion of Lord Walsingham it was resolved that, in printing in the *Journal*, and in the

House List of Candidates for the Council, the list of the Trustees, Vice-Presidents, and Members of Council, their residences and counties in which they are situated be added.

On the motion of Mr. Brandreth Gibbs, seconded by Mr. Torr, it was resolved that in order to keep a due check on the number of assistants' and servants' tickets issued to the Exhibitors in the Implement Yard—the number granted shall bear a definite proportion to the size of their respective Stands, and the Council decided that the proportion shall be two Assistants for the first 10 feet of shedding and one for every additional 10 feet.

It was announced that Professor Simonds would deliver a Lecture before the Members of the Society on Wednesday, the 17th inst., at 12 o'clock, "On the Nature and Causes of the Disease known as the Rot of Sheep."

The Council then adjourned to their weekly meeting on the 17th April.

It was only natural to suppose that Professor Simonds would have something more to say on the Sheep Rot than he offered on his first appearance after returning from Devonshire. Indeed, we are assured that he settled some two or three weeks since to give a Lecture at the Weekly Meeting, on Wednesday the 17th of April. Unfortunately, however, the country received no intimation of this until the day before the address was to be delivered, and, as a consequence, there was not a large gathering. We are still enabled to correct this by publishing the Professor's speech in full, thanks to the good sense of the meeting, which insisted upon this being done at once. The very critical time to guard against is declared to be Midsummer. It is then that, after a wet season, the flock is most liable to disease, a point that Mr. Simonds put with due emphasis. And yet an attempt was made to postpone the publication of the paper until its appearance in the next number of the *Journal*, that is in August or September, when, unfortunately, Sir John Johnstone had to leave the chair before the proceedings were brought to a conclusion. The resolution, indeed, for the immediate dissemination of the lecture had to be proposed twice over. In the first instance Mr. Arkell, a tenant-farmer from North Wiltshire, moved, and Mr. Holland, the new member of Council, seconded him, "That the lecture be published immediately;" but this receiving no attention from the Chairman, Mr. Fisher Hobbs moved the same thing in writing, which Mr. Brandreth Gibbs seconded. These gentlemen had then to demand that their proposition be put from the chair, as it very unwillingly was, and at once unanimously adopted. Had not the Meeting exhibited some firmness the critical time for guarding against the sheep-rot would have come and gone without the members knowing anything of what their veterinary authority recommended!

And the very pith of the Professor's address turned on this "guarding against." A great portion of it, as will be seen, went to the origin and development of the flukes. With the exercise of much tact Mr. Simonds

makes what at first looks like a very dry theme quite an interesting study for us all, and few will read his fluke theory without having their own observation quickened. The development of the creature is the new feature of the paper, and its gradual advance to perfection, with the circumstances that favour this, are arguments evidently only advanced after much careful consideration. Still, at the end of an hour or so there was some impatience exhibited as to the deduction to be drawn. What was the remedy? In plain truth, little or none. Mr. Simonds goes more for a preventive than a cure; and rather to getting diseased sheep ready for market than attempting to set them up again. After a wet season, or even for a year or two further, there is much to fear; and Midsummer, above all other periods, "the time to strike." Protect your flock from the weather, and feed high; give corn, and other nitrogenous food, and administer salt and tonics. There is not, perhaps, anything very new in this. It would seem to be the common course to adopt against the advance of any debilitating disorder; and is already, we hear, in use in Devonshire and other districts where the rot has been spreading its ravages. It is, indeed, remarkable to see how thoroughly SCIENCE and PRACTICE agree in their study of this common ill, and the means they would take to meet it. Very much what Professor Simonds said in Hanover Square, our correspondent, "A PRACTICAL FARMER," has advised us of:—"Give your sheep good rations of corn, or cake; keep them exceedingly dry; give them also an abundance of common salt," and so on. Again, "The late rains have thoroughly saturated every land; and they are so continuous, as never to give time even for partial drying. On this account every danger is to be apprehended, and every known preventive must be sought for to stem the dire irruption. *It is in preventing mainly that safety can be attained.*" This sentence is the very text-word of the lecture; and Science and Practice so far but echo each other. But, assume the sheep to be affected, and then the farmer says, "Push them into condition as fast as possible, and send them to market to make what best they may." The Professor very properly offers more minute instructions for getting them into condition, but with precisely the same object, "when you may perhaps be able to sell them as fair food, or what we might call pretty fair meat." There is a deal of valuable matter in the lecture. It is carefully collated, and well put together; but the difficulty is anything but overcome, and so far, either as the actual origin of the disease goes, or any effectual remedy for meeting it is concerned, it is a question whether we have advanced much upon what already was known. The strength of the paper is, that it presses common sense, easily available means and precepts which sufferers may have been too apt to overlook in their search for some more thorough cure. The Germans argue, the Devonians differ, and the Professor and the public profit, at least in some degree, by all they have to offer. Still the monster rises hydra-headed before us, and we can scarcely be said to face him. One man, however, is ready to do so. A French veterinarian has volunteered, through Monsieur Trehonnais, to come over and try his own prescription on some of the diseased animals, with the understanding that it shall be "no cure, no pay." The recipe is said to have been employed with effect in this gentleman's own country, and certainly nothing can sound fairer than

his conditions of trial. It is rather to be regretted that they were not accepted. However, a packet of his medicine has been handed over to Professor Simonds, who we believe is now testing it. The tonic here again is said to be the chief thing depended upon, but more than this is yet not known. The result of the trial should come as a pendant to the lecture now published, on some open Wednesday before Midsummer.

At a Weekly Council, on Wednesday, April 17th, Sir John V. B. Johnstone, Bart., M.P., in the chair, Professor Simonds delivered the following lecture on the Nature and Causes of the Disease known as the Rot in Sheep :

The subject to which I have to direct the attention of the meeting this morning is one which possesses a considerable amount of interest, in consequence of the great prevalence of the affection at this particular time, and the ravages which it is producing among sheep. I allude to the disease which is commonly designated by the term rot, so called probably from the circumstance that we find in the progress of the affection that the system of the animal arrives at a condition which is unfavourable to the continuance of the integrity of its organs; it breaks up, if I may so express it, into a decomposed mass, and hence there can be no doubt that this term has been given to the affection, from the ultimate effects which are observed to attend its progress. The disease is also known by other names in different parts of the country, which more or less set forth its pathology. It is known, for example, by the name of "bane" in the western parts of England, probably from the baneful effects which attend the malady. It is also occasionally called "coathe," a term which seems in part to describe, if not the nature of the affection, certain symptoms which attend its progress. It is somewhat difficult to trace out many of the local terms given to diseases; but I have been enabled, I think, satisfactorily to trace the origin of this term "coathe." It appears to come from the old Saxon word "cothe," which signifies to swoon or faint; and it is well known that animals affected with rot are exceedingly weak and debilitated, and sometimes so exhausted as to be liable to faint or swoon. I shall not intrude upon the meeting to any extent with regard to these names, but it will be necessary for me to refer for a moment to another term which is used not in England, but on the continent, to express this affection, namely, "cachexia," or, as it is called in French, "cachexie aqueuse," signifying a dropsical condition of the body. And this, again, sets forth somewhat the pathology of the malady, for we find that in its advanced stages there are dropsical or watery effusions which take place in the different structures: hence, consequently, the origin of the name. With regard to the term cachexia by itself, it simply signifies, in medical language, a bad habit of body; and it is not, therefore, by any means an appropriate one to be used for this affection. None of the names I have mentioned, in reality, at all show the nature of the disease; they simply describe certain conditional states of the body and certain effects which follow upon these conditional states, and it would be very desirable, if we possibly could, to employ such a term as should express the true pathology of the malady. I may observe at once that there are a great number of different diseases affecting sheep which pass by the common term "rot;" and this of course will explain why many different opinions are entertained with regard to the disease by different persons. These persons, in reality, describe two or more distinct affections, and hence they are not likely to agree as to their nature and symptoms. You occasionally hear such terms as "water-rot" and "fluke-rot," leading one to suppose that with one variety of rot you have a dropsical condition of the body, and that with another you have certain entozoa located in a part of the organism, and commonly designated flukes. I would rather, however, confine the term rot, if we are still to use it, to that affection in which we have flukes, as they are called, in the biliary ducts of the liver, setting aside entirely every other disease that has been classed under that name. I shall have to show you per-

haps in the course of my remarks that dropsical affections, although agreeing in their latter stages with some of the symptoms of rot, are essentially and totally different. The next remark that I would make with regard to this affection is that it is by no means new. It is not new to us at all; nor, in fact, can it be said to be so to more early investigators. We find the earliest writers upon the diseases of cattle and sheep making mention of the destruction which arises from time to time from rot, and they speak of a variety of causes in operation to produce this state of the animal organism. And not only is it not new in this country, but the same remark will apply to foreign countries, and I think it would not be going too far to say that there is no part of the globe where sheep have been domesticated in which we do not find this disease more or less prevailing. It belongs to no clime and to no country. This is a matter of some importance, because if the assertion be true, we shall see that all the supposed local causes in this country to which the malady is by many persons attributed, cannot possibly have reference to other countries. For example, some persons speak of the deleterious effects of certain grasses, such as the carnation grass. Now the carnation grass does not, so far as I know, belong to Egypt or to Australia, or to other parts of the world where this disease is met with; and this shows us, were there no other proofs, that we are not right in looking for any one special cause of this affection, in regard, at any rate, to the kind of provender upon which the animals may be feeding. It will perhaps be unnecessary for me to allude to the great losses which in all countries from time to time have resulted from outbreaks of this affection. In Egypt the losses are very considerable, and they are always found to attend upon the too early passing of sheep upon those districts that are overflowed by the Nile: hence some individuals have supposed that there sprang up upon soils of that kind plants which are injurious to sheep and produce this affection. But in this country also we have had serious outbreaks of the malady. Perhaps the greatest outbreak that ever occurred in England, or at any rate the one respecting which we have the most authentic information, is that which took place in 1830, in which it was supposed that we lost not fewer than two millions of sheep; and the result was that an inquiry, then going on in the House of Commons with regard to the depressing causes of agriculture, branched out into an investigation of those losses. I believe the Government fully ascertained that in the following year the supply of sheep to our metropolitan markets was diminished by 5,000—a circumstance that will help to show us to what an extent we have suffered in this country when these great outbreaks have taken place. From 1830 to the present time we have also had periodical outbreaks which have been more or less destructive, but none of them perhaps since that period have been so destructive as the present one. Speaking generally, I think I am right in saying that nearly all the southern parts of England, together with some of the eastern, and particularly the western parts, are at this time affected with this disease, and there have been some thousands of animals that have had to be disposed of at a very small cost, while others that have not been sold in the early stages of the affection have died by hundreds. I am acquainted with instances in my own neighbourhood, on the verge of London, where the losses have amounted from 600 to 700 sheep in a flock. I am now speaking more particularly of Welsh sheep, the ewes having been purchased and brought into the district for breeding purposes. Some persons indeed have scarcely a sheep left. One person in particular who buys 800 or 900 of these sheep has, I believe, not more than 40 or 50 now alive. In Sussex and in many parts of Surrey similar losses of sheep of far greater value have taken place. In the neighbourhood of Eastbourne some persons have lost as many as 500 and 600 breeding ewes of considerable value as Southdown sheep. These facts will show that the disease is not only very extensive, but that all kinds of sheep, from the most inferior to the superior, are equally affected with the malady. Having made these preliminary observations, I must pass on to speak of the nature of the disease, and to show what have been supposed to be the causes in operation to produce it. We have had a great number of theories as to the cause of the affection, but they have been more or less wide of the true cause, some, however, having approximated to it. For example, in Mr. Youatt's very excellent work—a work which I may say ought to be in the hands of every farmer—there is a very lengthened article upon

rot, not only giving his own experience upon the matter, but culling from nearly all those who have written at all sensibly of this affection. He comes to the conclusion that the disease is due to the inhalation of miasm, and hence that it shows itself more particularly in the summer months, though the progress of the disease carries it over into the autumn, through the winter, and even into the next year. He says that there are many deleterious emanations coming from the earth, where it is surcharged with moisture in damp and swampy districts; that the sheep inhale this miasmatic matter; that it induces a bad habit of body, and lies at the foundation of the malady. It is, however, not a little singular that Mr. Youatt, in stating facts with reference to the disease, should state one which positively contradicts this theory with regard to miasm, and he appears to have done it without noticing it at the time. The fact to which I allude is this—that on a particular farm there was one field in which there was a swamp, hardly to be called a pond, and when the sheep were turned into the field during the summer months they became affected with rot. This became so obvious to the farmer that after a time he hedged in the pond, and prevented the sheep from having access to the swampy part, and then the disease ceased upon the farm. Now, this being a fact of which I have very little doubt, it at once negatives the idea propounded with regard to miasm. If the pond had been thoroughly drained, the water being entirely removed, and the character of the soil improved, I can understand that miasmatic vapours would not have arisen from it; but the pond remaining as a pond or swamp, we can of course see that the miasmatic matter would arise from it just as much when it was inclosed with an ordinary fence as when it was open; and this therefore strikes at the root, or negatives to a considerable extent, if not entirely, the view which Mr. Youatt has taken of this affection. Then we have had other individuals who have spoken of impure food as the cause. They say that where there is abundance of moisture, together with an elevated temperature, we have a great growth of grass, especially in damp situations; that such grass is deficient in nutriment to the sheep; that the blood produced from such food is impure; and that hence arises a cachectic condition of the body. But this can hardly be said to be the origin of the disease, since it would be perfectly impossible for impure food or water, or anything else, simply as impure material entering into the organism, to call into existence these entozoa, upon which the disease depends. Others, again, have looked to certain plants as the cause of the malady; and there is nothing new in this. I have here a work written by Mr. Mascal, who was I believe the chief farrier to King James. It bears the date of 1587, and is the original edition. It treats of the maladies of cattle, and it has this passage: "It is good for al men to understand, specially shepheards, which things do hurt or rotte sheepe, whereby, they maie avoide the danger the better, ye shal understand there is a Grasse or weed called Speare Wort, the leaves are long and narrow like a speare, hard and thick, the steales hollow, growing a foote or more high, with a yellow floure, which is comonly in wet places, and there wil it grow most, or where water have stood in the winter. There is also another weed called Peniwort or Penie-grass; it wil comonly grow in moist and marrissh grounds, and it groweth low by the ground, and hath a leafe on both sides of the stalke like unto a penie, thick and round, and without floure, yet some doe saie it beareth a yellow floure, which will (as they say) kil sheepe if they eat it. Alsoe all manner of Grasse that landfloods doe overrun before a raine is not good for sheepe." Coming down to later times, we have had a theory which certainly ought not to be rejected without due consideration. It is founded entirely upon the existence of the fact that in this disease we have certain entozoa, to which I shall allude more fully, that are inhabiting the biliary ducts of the liver. These entozoa produce a number of eggs; these eggs pass out of the liver into the intestines, and are consequently expelled with the feculent matter of the sheep, in countless myriads it may be said. Some time ago a Mr. King (I do not know whether he had a medical education) wrote a series of papers in the Bath Society's Journal, in which he propounded the theory that the rot in sheep was due to this circumstance: that healthy sheep, if put upon pasture grounds where these eggs exist upon the soil, receive them into their organisms; that the egg produces the fluke, and that the fluke would consequently

thus find its proper *habitat*—it would reck out instinctively the biliary ducts of the liver, where it would locate itself and grow to perfection. This theory of the simple introduction of fluke eggs certainly did seem to have common sense for its foundation; but it was found, after a certain length of time, that there was little or no truth even in it; that the ova, for instance, of the fluke did not immediately produce young flukes. Some 10 years ago I put this to the test of positive experiment. I collected a great number of the eggs of the fluke—far more than it would be possible for a sheep to receive into its stomach in the course even of a summer's grazing. I took no less than a tea-spoonful of them, and it would be scarcely possible for you to count the number in a single drop of the water in which they are placed under the field of a microscope; and these, to the number of millions, I conveyed into the system of a sheep, which I kept six months, and then had it destroyed. On examining its liver and other organs I found that there were no entozoa at all in the biliary ducts. In reality there was not a single fluke produced from those millions of eggs so carried into the system of the sheep. This negative result was exceedingly valuable, and I may further remark that it fully confirms similar experiments carried out in Germany. Gerlach, who is connected with the Berlin school, I believe, has had recourse to experiments of the same kind, and invariably with the same result, thus proving that the ova of the fluke, if carried into the system of the sheep will not generate or develop themselves into flukes. We find then, that all these theories have been more or less at fault, and it is only within, comparatively speaking, a very short space of time, that we have approximated to anything like one which will explain the pathology of the disease. You will remember that I stated I was anxious to confine my remarks entirely to the malady in which we have certain entozoa within the biliary ducts. In the diagram before you you have a representation of one of these creatures. It is called the *Distoma hepaticum*, and is so designated in consequence of its having apparently two mouths or sucking discs—one placed at the anterior part of the body, which may be truly regarded as a mouth; and the other placed on the ventral surface, at a short distance below the neck, just where it terminates in the body. The animal, as I have said, inhabits the biliary ducts of the liver (which you have represented in this diagram); and if we slit up these ducts in any case of this kind we shall find that they are filled more or less to repletion with these distoma. Before going into the natural history of these creatures I may say that after a certain length of time they lead to an anæmated condition of the entire organism. They not only feed upon the bile which is produced, but they alter the structure of the liver by their presence, just as we find with entozoa in other parts, and when this is the case it is of course perfectly impossible for the liver to secrete healthy bile, any more than pure water can flow from an impure spring. The bile plays an important part in the manufacture of blood, and if it is not in a healthy condition, pure blood cannot be produced from the food which the animal takes. The result is that the entire organism is supplied with impure blood, while the system is being drained by the presence of these creatures. After a certain length of time we find that dropsical effusions take place, and then we have the disease established in all its intensity and in all its destructiveness. Having thus shown you that this is truly to be considered as an entozoic disease, it becomes a matter of great importance to see how these entozoa really do inhabit that part of the system of the sheep. When speaking of sheep, however, I may be allowed to remark, that although the affection is most destructive to this animal, it is not exclusively a sheep-disease. These creatures have been found not only in cattle, but in pigs, in the ass, and also in the human subject. They are very widely dispersed, but it is in the sheep in particular that they accumulate in such numbers as absolutely to produce this special or specific malady. We come now to inquire a little into the natural history of the distoma, that we may see what light it will throw on the nature and progress of the disease, and upon the means at our disposal for preventing or curing the affection. It is self-evident that if a disease depends upon a special entozoon, if we are thoroughly acquainted with the natural history of the creature, and if by means of that knowledge we can destroy it or get rid of it, we shall thus be able to neutralize its effects; for if we remove the cause, the effects must cease. Now, without unnecessarily occupying time,

let me say that this diagram shows dissections of the entozoon, more particularly with regard to its nutritive and generative system. You see that the sucking disc to which I before directed your attention, is in reality a true mouth with which the creature takes in the bile with which it is surrounded in the biliary ducts; and that this bile passes down through a system of vessels which are in reality assimilative vessels, and consequently may be regarded as nutritive. You observe there is a peculiarity with regard to this nutritive system. We see an entrance for the material by which the life of the creature is maintained; but we see no excretory organ—we cannot perceive that any feculent matter is thrown out as such from the hinder part or the sides. Strictly speaking, then, this is really an organ by which the creature receives into its system that which it requires for its growth, and by which it also rejects from its system that which is not needed. And here let me say, that although there are many works upon the anatomy of the fluke, containing very nice drawings or engravings; though Professor Owen gives an engraving of the creature in this work on the Invertebrata, and Rymer Jones another in his work on the animal kingdom—in short, though there are fifty or more representations by as many individuals, there is really none that can be depended on as being perfectly correct. I say it advisedly, because I have been engaged in investigations with regard to the anatomy and natural history of this creature for eight or nine years, taking up the subject from time to time, and working at it occasionally for days together; and it is only very recently that I have been enabled to satisfy myself as to some intricate points of its structure. I have seen these animals, when taken fresh from a slain sheep, and placed in warm water, eject the biliary matter again and again from the oral opening, which thus, as I have said, performs the office of an excretory organ as well as being the one by which the creature receives its nourishment; and the nutritive system has really nothing whatever to do with the generative system. The great point of interest, however, is the system of generation, which, when we come to examine it, we find to be exceedingly complicated, the two sexes being blended together in one individual, as we find in many other creatures. It is not to be considered as an hermaphrodite—that term is not strictly applicable to it—but it is a bi-sexile, the two sexes being distinct, separate, and perfect. In whatever animal you meet with these entozoa, they are precisely alike in this respect. We have here a representation of the generative system, from which we find that the male organs are contained in the centre of the body, and that the female organs have their origin at the periphery, uniting in ducts which meet in the middle, where the true uterus or womb is located, and which is here represented as being filled with a great number of eggs. And after these are perfected they escape from an opening which is very near indeed to the central sucking disc. With regard to an appendage near this, and which is sometimes protruded, and sometimes retracted into the body, it has been supposed to be an intromittent organ or penis, and its existence in all these creatures would rather seem to show that although they are bi-sexile it is not improbable that copulation takes place between them. We know of a similar instance with regard to snails, which are bi-sexile, and it is well known that they are furnished with an intromittent organ as well as a vagina, and that the intromittent organ of the one extends into the vagina of the other; and I say it is not improbable that this takes place with regard to the fluke, but this point is not at present known. The sucking disc, as it is called, which is seen on the ventral part of the animal, is simply an organ which evidently performs the office of holding the creature on when it is traversing the biliary ducts, forming a kind of focal point whence it can travel and insinuate itself into the minute ramifications of the ducts. Nor is it improbable, if copulation does take place between two of them, that these two sucking discs approximate to each other for the purpose of contact during that period. If you take any fully-developed fluke it would be perfectly impossible for any one to say what number of ova such a creature contains; but there is one circumstance especially which renders the ova interesting to us, namely, that if we examine them never so carefully, and any number we please, those that have been naturally expelled from the creatures as well as those that are contained within them, we shall find that there never exists within the ovum anything of the outline of the young fluke; and this fact being established, it is evident that in order for the fluke egg to produce ulti-

mately a fluke, the germs contained within it must pass through a series of transmutations—that either metamorphoses, as they have been called, or alternations of generations, must take place; and it is by studying these that we can get at something like valuable information with reference to the manner in which these creatures are propagated. It is now several years since I thoroughly convinced myself of this fact, and I believe nearly every person who is at all observing or familiar with the circumstance knows that if you slit up the gall ducts of sheep or any other animals long affected with distoma, though you may see some of these creatures smaller than others, you never see what might be called a number of young flukes; nor will you be able to discover a young fluke by microscopically examining the bile in which they live. This, then, together with the other circumstance to which I have referred, shows at once there is not a reproduction of these entozoa within the biliary ducts; so that (to put it in a practical way) supposing a sheep to receive six of these flukes into the biliary ducts, they would never multiply therein. They would deposit millions of eggs in the smallest ramifications of the ducts—instinctively deposited there, it would seem, for the purpose of preventing them from too rapidly flowing out by the contractile functions of those ducts—but you would never have more than six flukes. Now, what does this explain? It explains a fact of every day occurrence. A person will often tell you, “I sent a lot of sheep to the butcher: I never had more perfect or beautiful animals: they were as fat as sheep could be; yet the butcher found eight or nine or ten or twelve flukes in the liver.” The fact is that here they did not exist in sufficient numbers to lay the foundation for disease. If it were otherwise we can see that if one fluke only passed into the biliary duct it would multiply almost *ad infinitum*, and the animal must ultimately fall a victim to the affection induced thereby. Here then we have a practical result at once, arising with many others from an investigation of the natural history of this creature. I have said that it must pass through a series of metamorphoses, or what have been designated alternations of generations; and perhaps I may be allowed to explain the difference made by scientific men between the two. In alternations of generations we have an animal which bears a young one as an ovum; the young, however, which come from the ova are dissimilar altogether from their parent, but are nevertheless capable of a new system of generation, and the young which they propagate as a second or a third step, pass back to the original form. Ordinary metamorphosis is a different thing. Take the case of a bed-flea for example, that being the first that occurs to me. The animal produces ova; these ova produce larvæ; the generative system becomes developed, but the larva does not propagate: it attains its full size, and then becomes a chrysalis or pupa; subsequently the perfect flea is formed out of the chrysalis, and it is in that state that the generative system reaches its highest order of development. There is no alternation of generation, in other words there is no generation from the larva or pupa. Now this is a part of the natural history of the fluke, which, although it has received the greatest amount of attention from investigators on the continent and in England for some time past, is still to a considerable extent shrouded in mystery. We have satisfied ourselves, as I have before explained to you, that we have from out of fluke eggs living creatures exceedingly small, much smaller than the egg itself, and that these do not immediately pass into flukes, but go through a series of alternations of generations. Now what I am going to explain will only allow of an analogy with regard to these creatures. Before explaining it, however, let me say that we believe that each of these fluke eggs, which you see represented in the diagram, contains a number of moving ciliated cells, which are more or less round in form; that these, passing into water for example, when the operculum comes off, are set at liberty; that they become parasitic to some of the creatures which are met with in water, and that when so parasitic they have the capability of propagating themselves; that they subsequently pass through a series of changes, and again become, as I shall show you by analogy, parasitic a second time to other creatures when they change into the fluke-like form. So that tracing the process all through we may say that the egg sent forth a circular germ which was ciliated, and which had a rotatory motion in water; that in this condition it becomes parasitic probably to molluscs, small snails, and things of that description; that when it gets into the body of these creatures, work-

ing its way in just below the skin by the cilia which it possesses, it undergoes a perfect change, becoming something like a chrysalis, in which condition it propagates itself; that the creatures immediately coming from it reach a certain order of development in the snail; that they then escape from it, swim about in water, and, after a certain time, again become encased, and again become parasitic to the snail, in order, in reality, that they may reach a higher form of development. This is explained in one of my diagrams. Putting aside the eggs as representative of the distoma, we go back to a peculiar organism, as an analogy, which is often met with in small water snails, slugs, and the like, imbedded underneath the common integument in different parts of the body. It has been called a cercaria-sac, so called from the creature which issues from it being a creature with a tail, which swims about in water. In this sac we have vital germs—very small granular matter—which are sent off as gemmae or buds, lying beside a kind of intestinal canal. We find this budding process going on, and we have a considerable number of these germs ultimately set at liberty; within the sac these develop into the true cercaria, and when they have arrived at a certain period of development they burst through the sac, and swim freely about in water. The diagram represents the different degrees of development. You have first the small germ, which as a gemma or bud, comes off, becomes elongated in one part of its body; that subsequently elongates into a tail-like appendage, other organs are then added, and in this condition the creature bursts through the sac, leaving others to come out of it produced in the same manner. It swims about in water with a long floating tail, and it has been viewed as one of the infusoria. Subsequently it curls itself up, and as a general rule gets in the first instance upon slugs, entering the slimy matter which covers them, and imbedding itself in that. It then becomes encased in a kind of shell again, and lies just underneath the skin of the snail, and from this state it goes on developing within the snail until it forms a distoma. So that there is no doubt, whatever may be the origin of these cercaria, so far as they are parasitic to snails, we have traced the whole history of them. Therefore by analogy we imagine that, as we have germs of a similar nature which become parasitic from the ova of the true liver fluke, that these pass through a series of similar changes, and that in this imbedded condition they either remain in the water attached to plants, or to smaller creatures inhabiting water, especially slugs and snails; and that when these pass into the stomach of the sheep they find their proper *habitat*, and develop into flukes. It is important to bear in mind that the last transformation takes place, not in the liver, not in the biliary ducts, but in the stomach or intestines of the animal. You will see presently what importance there is attaching to this fact, which has only very recently come to light. Now, if we accept this as an approximation to the truth with regard to the development of flukes, we shall find that it unravels the whole mystery with reference to rot. It explains at once why certain districts are dangerous. It explains the occurrence which has been recorded over and over again, that out of a hundred sheep, for example, ninety-nine having strayed over a common, and one having been accidentally prevented from doing so; that subsequently the ninety-nine have been attacked with rot, while the one that remained behind escaped. I have recently received a letter from a well-known agriculturist—Mr. Edward Umbers, of Wappenbury—in which he has been kind enough to give me the particulars of two cases of this kind. Many years ago some sheep belonging to his father were found, subsequently to their purchase, to be affected with rot, and in tracing the matter out it was found that the sheep had been left in what was called a dangerous part of the country for a short space of time while the man went into a public-house close by to get some refreshment. If you look at Mr. Youatt's work you will see numerous cases of this description. And what is the explanation of them? I have known the time when I have stood in the lecture-room of our own Institution and combated this view, and never could become a convert to it till I became more enlightened as to the natural history of these entozoa. I now believe that it is perfectly possible for sheep to be free from the cause of rot at this minute, and to receive it at the next; that is, if they are placed under circumstances where they can obtain these creatures in one of their forms, or in a

particular stage of development. Now let us suppose we have the cercaria rolled up into the form of a creature something like a chrysalis covered over by its shell; let us also suppose that which is positively the fact, that hundreds of these creatures can be seen upon small molluscs, many of them also loose in water—that they are adhering likewise to plants and growing in damp situations; then a sheep has only to drink a mouthful of water to take in an infinite number of these creatures, and, taking them into the stomach, they there become developed into flukes. We have therefore, very good ground for believing that rot can be very readily and rapidly received. Now there are certain difficult ties which people put before us with regard to this theory. They want to know how it is that we get rot in certain seasons and not in others. Well, we show that whenever there is an excess of moisture—wherever, in fact, we have great rain-falls—certain pastures and places, which are perfectly free from the disease at other times, now become affected. This is easily enough explained. We have seen that the ova of these creatures come out in millions from one affected sheep: what, then, must be the number of them in hundreds of sheep so affected! Now, by direct experiment, I have proved this—that you may take the ova of these flukes, and keep them upwards of a year before there is any change taking place in them. We know not, therefore, what is the duration of the life of these ova. It is just possible that they may remain, not only one year, but two years, without undergoing change, until placed under favourable circumstances to undergo that change. If, then, we look at the vast numbers in which these ova exist, and at their power of maintaining their vitality for a great length of time, we get rid of a considerable amount of difficulty. Then we find that when we have an excess of moisture, and with that an elevated temperature, the living germs, if I may so call them, that are now separated by the bursting of the operculum of the egg, are set at liberty and become parasitic to other creatures, passing through the series of transformations comparatively quickly, and being at length very easily received into the system of the sheep. I have referred to an elevated temperature combined with excessive moisture; and what is the practical observation which is made with reference, for instance, to watery meadows? It is notorious that sheep placed upon water meadows receive the rot; but it is equally notorious that it is only at a certain period of the year that they will do so. You may, as every practical man knows, put sheep upon water-meadows during the winter months, or in the early part of the spring; but if you water your meadows in the month of May, and then get a luxuriant herbage springing up afterwards, and put the sheep on this, you are almost certain to rot them. As you approach Midsummer, the danger increases; and as you approach the winter, it decreases. That single circumstance shows that, when there is moisture and heat combined, the cause of rot is brought into operation. I have spoken of the great losses amongst sheep affected with the disease. When were the sheep first affected with rot that we are now losing? I answer, last Midsummer and forwards towards the autumn. That is the time to which you have to look. The cause was received then; the development has been going on in the flukes since that time. They have now attained their full size, and they are producing mischief in anemiating the sheep. When we talk about curing rot, we must talk about taking cognizance, if possible, of the early existence of the disease; then is the time to bring into operation certain causes which will prevent the malady. I have here, for the inspection of the members, some early-developed flukes, the only early ones I have been able to meet with. I have had them by me seven or eight years. They were taken out of a young sheep—and this is an exceedingly interesting fact, because it bears out what I have said—in which there was not one large fluke, and consequently there was not a single ovum in the ducts. They are simply the youngest form of the fluke development from out of the infusorial creatures to which I have before referred, that have found their way into the biliary ducts. They were sent me by an amateur pupil of the Veterinary College, from Redgrave, in Suffolk. They were taken by him, in September, 1853, from some lambs which had come on the farm six weeks before. It was a marshy farm, and the lambs were placed literally upon fen-land, as it is called. Having explained, though not so much at length as I

should wish to have done, what I believe to be the true explanation of this disease, I must pass on to make some more common-place observations with regard to the means which we have at our disposal for the first ascertaining the existence of the malady, and then putting into requisition the means which will effect its cure or prevention. With regard to the symptoms by which we recognize rot, it is universally admitted I believe, at least by all practical men, that in the earliest stage there is no great depreciation of the value of the sheep, that it does not apparently suffer any inconvenience, but that it rather accumulates flesh faster. The explanation of this is easy enough: The small flakes enter into the liver, not perfected, but having of course to be perfected in size, and to have their generative system fully developed in the gall-ducts of the liver. When they first pass in, although, perhaps, in very considerable numbers, they simply act as a stimulus to the action of the liver, and consequently call forth an increased secretion of bile; and as there is no alteration in the character of the bile, the sheep now being fairly supplied with an ordinary amount of food, will make relatively a larger quantity of blood out of such food. The liver being in a state of activity, and scarcely bordering upon disease, the sheep will lay on a larger quantity of flesh. We have an authority for this in the observations of the late Mr. Bakewell, and since his time, as well as before, the same thing has been observed, but not to the same extent. I have had a good search through different works to find the authority, and in Arthur Young's *Farmer's Tour in the East of England*, Vol. I, he thus writes: "Relative to the rot in sheep Mr. Bakewell has attended more to it than most men in England. He is extremely clear, from long attention, that this disorder is owing solely to floods—never to land being wet only from rains which do not flow, nor from springs that rise. He conjectures that the young grass, which springs in consequence of a flood, is of so fleshy a nature that it occasions this common complaint. But, whether this idea is just or not, still he is clear in his facts, that floods (in whatever manner they act) are the cause. Perhaps the most curious experiment ever made in the rot of sheep, is what he has frequently practised. When particular parcels of his best bred sheep are past service, he fats them for the butcher, and to be sure that they shall be killed and not go into other hands, he rots them before he sells, which, from long experience, he can do at pleasure. It is only to flow a pasture or meadow in summer, and it invariably rots all the sheep that feed on it the following autumn. After the middle of May, water flowing over land is certain to cause rot, whatever be the soil. He has acted thus with several of his fields, which without that management would never affect a sheep in the least; the water may flow with impunity all winter, and even to the end of April, but after that the above effect is sure to take place. Springs he asserts to be no cause of rotting, nor yet the grass which rises in consequence, unless they flow. Nor is it ever owing to the ground being very wet from heavy rains, unless the water flows. This theory of the rot (adds Young) upon the whole appears satisfactory, and that part of it which is the certain result of experience cannot be doubted." Speaking of watering meadows, in Vol. III, of same work, p. 310, he says that Mr. W. White, a tenant of Mr. Frampton's, of Moreton (Dorset), "remarked, and it is the general observation of the county, that those watered lands never rot sheep in the spring, though they immediately follow the water, or are turned in at any time, or in any manner; but if they are turned into the after grass, it merely rots till the autumnal watering, after which they are safe. They keep their sheep in till May-day, which, they assert, would be sure to rot them, was not the land watered; and, also, that the very best land in the country for rotting, is perfectly cured by watering." Subsequently to this the deviations from health are exceedingly slow, and it may be said that they are insidious. It is very difficult, therefore, for us to say what are really the early symptoms of rot, if we except this accumulation of flesh. There can be no doubt that in an advanced stage of the disease, we take cognizance of the affection very readily; but unfortunately it happens that the symptoms which then show themselves, are such as to prove to us that the system is breaking up, and that the time has past for curative measures. At first, I say, these symptoms are exceedingly insidious, but subsequently to this accumulation of fat they are well marked. For instance, after a certain length of time we find that such animals have an occasional cough,

that their appetite is somewhat impaired and fastidious—to-day feeding pretty well, to-morrow scarcely at all. They will be easily acted upon by all external causes, and if exposed to wet and cold will suffer a great deal of inconvenience. Much of the progress of the disease will depend upon the treatment to which the animals are subjected. I may say by the way that I am familiar with one case in which a gentleman in Norfolk, who has a sandy-heath farm, purchased some sheep in the latter part of August in one year, and he was not aware that they were affected with rot until the February of the following year. Being satisfied that the sheep had not received the disease while they were in his possession, he sought out the dealer from whom he bought them, and on tracing the matter out, it was ascertained that other portions of the same flock were also affected; the dealer consequently took them back and paid the cost of them. The slow progress of the disease was entirely due to the circumstance that the sheep were placed upon a dry sandy soil, well supplied with highly nitrogenised food, and not exposed to great inclemency of weather. Had causes of the opposite kind been brought into operation, the disease would have much earlier declared itself in the most unmistakable manner. I have stated that the animals have an impaired appetite; subsequently there is a gradual wasting of the body, and this is a matter of some importance to us, because we find it takes place even before other symptoms which are looked upon as unmistakable evidences of the existence of the disease show themselves, at any rate to any great extent. It is always a suspicious circumstance if you find that animals have done remarkably well, and then towards the latter period of the year, when they should be going on maintaining their condition, they begin to waste. If you put your hand upon them and find them "lean on the back" as it is called, that the vertebrae are sticking up, and are bare of flesh, if you find the animals "razor-backed," if I may use the expression, it is a pretty good indication that they are affected. This state of wasting being once established, it continues, and we then get a pale state of the skin, which becomes of a yellowish tint, and very frequently it may be said that jaundice to some extent becomes associated with dropsy. If you open a sheep which is in a somewhat advanced stage of the affection, what will you observe with regard to its fat? That it is particularly yellow; and if I were an inspector of the metropolitan markets, and were to see a number of sheep which were very deficient in flesh and in fat, and that which existed was of a yellow colour, I should at once infer that they were affected with rot; and I know from experience that I should rightly come to such a conclusion. We afterwards find that the inner angle of the eye becomes exceedingly pale, so that when we evert the lids and press forward the *membrana nictitans* of the eye, we find instead of its being in a healthy condition, that it is covered with a number of red lines, marking blood-vessels through which the blood flows, that the blood being deprived of its red cells, the organ is colourless. Now, it may be said this is little more than shepherd's knowledge. Well, we admit that it is shepherd's knowledge, but it is nevertheless valuable to us as far as it goes, especially if we associate it with other symptoms. Next we have, generally speaking, a symptom which shows itself in conjunction with this wasting, this fastidious appetite, this yellow state of the skin, unhealthy condition of the wool, and blanched state of the vessels, namely, increased thirst. You generally find that these sheep, having the facility of getting down to the water, will very frequently be drinking to a much larger extent than healthy sheep will do. This evidently arises from the circumstance that there is a great drain going on upon the system, that the blood itself is being deprived of its watery matter, and that water must be taken into the organism to make up for the drain. We find further, that as the disease advances a variable state of *faeces* exists; sometimes the sheep will be scouring, and at other times nothing of the sort will be observed; and it is always a suspicious circumstance to find sheep in the autumnal months occasionally scouring. I would rather see a sheep with a regular lax condition of the bowels, than one with a relaxed state to-day and an opposite state to-morrow, which may continue for three or four days, and then give place to a lax condition again. We can easily explain how this is. The bile will be poured out irregularly into the intestinal

canal, and as it is now changed in its character it will act as an irritant to the mucous membrane of the intestine. The flukes frequently form mechanical impediments to the free flow of the bile, when they have so comforted themselves, as to crowd into the passage, but when the impediment is overcome, there is a great flow of bile, and the contents of the intestines are necessarily carried off in the form of fluid faeces. Of course, such animals lose their strength very quickly. They are dull, dispirited, and often found lying down. As the disease advances, the breathing becomes somewhat difficult; the wool is easily removed; oedematous swellings, as they are called, begin to show themselves and to accumulate in different parts of the body, more particularly under the lower jaw. These are nothing more nor less than dropsical effusions, the animal is anæmiated; the blood is surcharged with serum, and then you have these effusions finding their way into the areolar tissue in different parts of the body, passing freely through it, and accumulating particularly, as just observed, under the lower jaw. Why is this? Because the animal frequently has its head pendant, and in the act of feeding gravitation of fluid takes place. This anasarctous condition marks a similar state of the internal organs: thus you get effusions into the cavity of the abdomen, and hence many a rotten sheep will have an enlarged, pendulous belly. This emaciation continues until it leads to the death of the animal. It may die within a short time, a few weeks; but even under the most favourable circumstances, it is rare that an animal will die in less than six weeks or two months; death, however, may be protracted for a much longer period. I come now to speak of the treatment of the disease. The treatment, then, of rot, speaking of it as curative treatment, must have for its end and object the removal of the cause, and if we have these entozoa which are the proximate cause of the affection, all our efforts must be made to the displacing of them from the biliary ducts. It is to be borne in mind that we have to combat, not only with the cause, which is a continuous one, but with the effects, which are also continuous for some considerable space of time. I make this remark for the purpose of saying that I believe if we were enabled at the present moment to take sheep in an advanced stage of this disease, as they would necessarily be at this period of the year, and give them any agent which should destroy or remove from the biliary ducts (which I do not believe possible) every fluke contained in them, we should not succeed in saving the life of the sheep. Because, as I have endeavoured to show, their presence produces mischief in two ways; it leads to organic changes in the structure of the liver, and the breaking up of the entire organism of the animal. We cannot put a new liver into the animal, and the powers of life cannot be supported by us long enough to bring the system into a normal state. But, although I say this, it is equally true that we must look to the cause, for the purpose of getting rid of the effects. I repeat the remark, because it is important to remember it, that there is no multiplication of these creatures in the biliary ducts. If, therefore, we were to adopt treatment early in the case when there are but few of these entozoa, it would necessarily be attended with success. We are to measure the danger of the animal by the number of flukes existing in the biliary ducts, and by the length of time they have so existed. It is proved by daily experience that we can resist to some considerable extent the inroad of the disease, and we have, therefore, to look to the means which are at our disposal for the purpose of keeping the animal body together, if I may so express it, that the ultimate loss shall not be very great. Now, how is this to be done? It is to be done in the first place, wherever it is practicable (but it is not always so), by protecting sheep from the inclemency of the weather; and in the next place, by abstaining as much as possible from all succulent vegetable food, all food which has an excess of moisture. We should give the animals as much nitrogenous food as we possibly can, so as to lay the foundation for pure healthy blood, and we want at the same time to throw tonics into the system, with a view of medicinally strengthening it. What should these consist of? It is rather difficult when a man has 500 or 600 sheep to be giving them tonic agents in the form of draughts, and we are obliged to choose something which will of itself be unobjectionable to the animal. Sulphate of iron is an excellent tonic for purposes of this kind. Not only is it a good invigorator of the system, and an agent which sheep will take readily; but it is to be borne in mind, that it is in itself a

very excellent anthelmintic, and may do much good in that way. So that if in December or January I had taken a number of sheep affected with this disease, but not the subjects of structural change in the liver, and given them nitrogenous food, protecting them as much as possible from the weather, and exhibited to them sulphate of iron; if I had husbanded the animals' powers to the greatest possible extent, and added also, from time to time, some salt to their food (which I shall have occasion to say a word upon presently), I have no doubt I should not only have kept them alive, but been able to sell them as fair food at a small cost in the market. If, however, I neglect all these things, then I have to deal with the ultimate consequences of the malady. I may just say, that experiments have borne out what I have now stated. You will be aware that this Society has lately voted a certain sum of money for new experiments to be made with regard to the treatment or cure of rot. We are indebted to a gentleman present, M. Tréhonais, for directing the attention of the agricultural community to this supposed means of curing the disease. He has also kindly forwarded to the institution a quantity of medicine, with which experiments will be begun immediately. Now, without any analysis of the medicine, I am well aware of the principles that have guided the individual who has sent it to us. He looks upon the disease as one producing perfect prostration of the vital powers, and he attempts to throw tonics into the system, especially giving instructions that the sheep should be kept as much as possible from wet and cold, and have the most generous diet. I was about to say, that very frequently where you have only a limited number of these entozoa, as they do not increase in the liver, if the simple plan of protection with nitrogenous food, and so forth, is persevered in for some time, you may often save your animals. I did that many years ago. I purchased a lot of rotten sheep; I gave them no physic of any kind, but merely kept them in sheds during the winter time, feeding them with corn and cake, and giving them the most generous diet I could; and I not only prevented the further progress of the disease in several of these cases, but I even made the animals accumulate flesh, and they went into the market in the following Spring, as fair meat for the people. This shows what can be done by generous diet and protection of the animals. These remarks may cause a smile, but it is not to be presumed we are desirous as farmers of sending rotten sheep into the market, especially when we remember that a man has been sentenced to six months' imprisonment in Newgate for the offence. Nevertheless, we must secure as much food for the people as we possibly can. When we have animals in this condition, there will be a great advantage arising from the employment of diffusible stimulants, and such, which to some extent, are powerful anthelmintics. For example, we may use turpentine (which the animals must of course be dosed with) in conjunction with sulphuric either as an invigorating agent, and at the same time as good anthelmintics. If I were to take half-a-dozen sheep, and simply give them sulphuric ether with oil of turpentine day by day, attending to the other things that I have mentioned, not neglecting salt as a stimulant to the digestive organs, I think it very likely that two or three of them (according to the stage of the disease) would be greatly benefited by treatment of this kind. But that is really not the great question for us to consider. We are not to become advocates for the curing of rot in sheep; but we are to become advocates for preventing the disease, and that is the reason why, as bearing upon this point, I detained the meeting so long with regard to the natural history of the fluke. It is well known that sheep do not rot on salt marshes: no matter how wet they may be, no rot takes place on them. But if sheep are affected with rot upon marshes which are not salt, it is of very little use sending them to salt marshes, for you cannot in that way cure the disease. Now, what is the explanation of that fact? It is simply this. The infusorial creatures that we have been speaking so much of, are creatures belonging to fresh-water and not to salt-water. If therefore we were enabled to take a quantity of salt sufficient to render all these damp swampy places in our meadows or pools completely salt, we should destroy the whole of these creatures, and so get rid of the cause of this affection. But we cannot do that. Some persons, being only partially informed on this subject, have been talking of late of strewing salt over the meadows and letting the sheep go upon them. That would be of no advantage, for you could not use a

sufficient quantity necessary for the purpose without destroying the whole vegetation upon the meadows; anything short of that would be positively of no benefit whatever to the sheep. Now, bearing in mind the transformations of the fluke—bearing in mind the fact which I have mentioned, that the last change takes place in the stomach and not in the liver; and the other fact, that salt is destructive of these infusoria, as we may call them—you will see that if you convey salt in sufficient quantity into the stomach you may destroy them there before they undergo the last change, and then as flukes find their way into the biliary ducts. Thus, if you can prevent that last metamorphosis you get rid of the cause. I am therefore bold enough to say—not that I depend entirely upon salt, because I shall have a word to say in regard to something else; but that I do believe that rot may be prevented to a very considerable extent, and I further believe that we may save, even in our worst years of rot, a great number of animals. What would be the means by which I should prevent the disease? I must bear in mind all the facts of the case. I must bear in mind the influence of excess of moisture with an elevated temperature. When is the dangerous period to sheep? As you approach towards Midsummer. Then if that is the dangerous period to the sheep, and for the reasons we have stated, we must prevent the disease then; that is the time to strike at its root. Instead of grumbling about our losses in the winter months, we ought to have taken measures for preventing them during the summer. Now what have we had in the past season? We have had a very wet summer. I happen to be an unfortunate farmer—unfortunate, I say, because, like many others, I have not had a very profitable return this year, but I had a number of sheep, and foresaw what was coming. I said to some of my neighbours, “We shall have a great deal of rot this year”; and I thought I would attempt, if I could, so far as my own sheep were concerned, to save them. What did I do? The sheep were on wet meadows up to the fetlock joints nearly every day, and nobody could avoid it. But at Midsummer I began to feed the lambs and sheep with corn and nitrogenized food, giving them with every meal a small quantity of salt. I continued that plan during the whole summer and autumn, and I have the satisfaction of saying that I do not believe at the present time I have one of those lambs affected by rot. I kept killing them week by week to watch their progress. And here I may incidentally observe that long-continued wet weather is very prejudicial to the sheep in another way. I refer now to the so called water-rot. What was the state of the liver of these animals at Midsummer? There were no flukes or anything of the kind, but the liver was streaked with white lines here and there, and generally pallid. This was for the want of nitrogenized matter. The bile-cells were blanched; the liver had become structurally diseased, and as such it was a good nidus for these entozoa to inhabit. Not only, however, did this simple treatment prevent the entozoa, but it brought about a healthy state of liver, for in the course of a month or two I found that the organ resumed its natural colour and consistence. I again say, that if we commence at midsummer, and continue the treatment through the entire dangerous period of a wet season, we may do a great deal in the prevention of the disease. And I may go further, and say that even on farms where we have what are called rotten-pastures, on which sheep are placed, the animals might be preserved to a very considerable extent simply by giving nitrogenized food and salt, to destroy these creatures within the stomach, and prevent their final change, alternating with the salt a tonic, invigorating agent such as sulphate of iron. I do not depend on the salt alone; far from it, but it is a valuable agent, and its value depends more upon putting the infusorial creatures and young flukes into salt-water, as it were, in the stomach, than anything else. This is the course I recommend. You have to look to the condition of the liver in a wet season; you have to look to the necessity of laying the foundation for a good quality of blood, by giving the animals nitrogenized food, and throwing sulphate of iron into the organism. Every practical pathologist, human or veterinary, knows very well that if you have an anæmiated or bloodless state of the system—if there is a deficiency of the red cells, upon which the invigorating properties of the blood depend, those cells will rapidly multiply, and the blood regain its proper colour by the use of iron. This is the reason why sulphate of iron should

be employed. It should be given in fine powder about twice or thrice a week, and in doses of about half-a-drachm a day; not, however, that a larger quantity would be prejudicial. The sheep should be divided into small lots; and if you have about a score feeding in one trough there should be ten drachms of sulphate of iron mixed with the food for the day; and then, if one should get a little more, and another not quite so much, it will be of very little importance; alternated with the sulphate of iron we must also employ salt. There are matters of detail which of course every individual farmer must carry out for himself; but if he will adopt these leading principles that I have attempted to lay down this morning, in a very imperfect manner, he will save a considerable number of his sheep from falling a sacrifice to the affection which is commonly designated “rot.”

The CHAIRMAN said he had no doubt that some gentlemen would propose a vote of thanks to Professor Simonds for his interesting lecture. If the natural history of the fluke be discovered at all, they must feel very proud that the discovery should be materially assisted by the researches of the veterinary professor of the Society. He had never before understood the nature of the operations of those little creatures, nor had he been aware of the length of time they could lie dormant in the system of the sheep before producing the disease. He congratulated the Society on having a gentleman connected with it of Professor Simond's attainments. They were also under great obligations to M. Tréhouais, who had supplied medicine to the Society for the purpose of performing the experiments to which reference had been made, and from which he hoped good results would follow.

Sir J. JOHNSTON here vacated the Chair, which was occupied during the rest of the sitting by Mr. Raymond Barker.

Mr. THOMAS ARKELL, of Wiltshire, said he was very much pleased with the lecture, and hoped it would be immediately published for the benefit of the agricultural community. From the observations which had fallen from Professor Simonds, and from what he himself recollected, he thought they were standing on the edge of a very fearful precipice. He remembered the period to which Professor Simonds had alluded—1828, '29, and '30—when there were three wet seasons in succession. He had not referred to a meteorological table, but he felt satisfied that the greatest quantity of rain did not fall in 1830, but in 1828 or '29. Scientific men said that the seasons went in cycles. If so, comparing the last year with 1828, they might expect two wet seasons to follow the last; and it was time, therefore, to be up and doing. He well remembered that in the first season there were a great many rotten sheep; in the next a considerable number more, and in the third season the disease swept off nearly all the sheep in the district to which he belonged. It was a question with him whether the heat of 1830 had not more to do with the height to which the disease had arrived than the additional quantity of rain. He could confirm the statement of the lecturer with regard to the value of salt, from his own experience. Last season, which was a wet one, he gave his sheep salt through the summer, and the result was a successful lambing, very few having been lost. One was lost from being fed on swedes; and on examining the liver, there were no flukes to be found in it: the liver was pale, and the gall-bag white. He was desirous of knowing, and the lecturer had answered the question, whether stimulants would not be likely to save a flock in that condition. A veterinary surgeon, a neighbour of his, had recommended sulphate of iron in the food as likely to bring about a healthy state of the liver. With regard to the drenching of sheep, of course that operation could not be carried on to any considerable extent, and the medicine employed should be chiefly given in the food, something not very nauseous, which should be mixed with the cake or other food taken by the sheep. It was well known that farmers were liable to lose legs in fattening them; and last year he (Mr. Arkell) bought some advertised cattle food as a medium for the administration of physic. It would, he thought, be well if something authoritative in the way of a proper cattle food could be put forth for the benefit of the farmer. He gave in the food which he purchased some sulphur and saltpetre, which the animals took, and after that period he lost but few of them. He thought if a list could be published of the different medicines for sheep in the various stages to be mixed with their food instead of drenching, it

would be of great service to the agricultural community; while the veterinary officers of the Society might recommend some prepared food in which it might be administered.

M. DE LA TREHONNAIS said that, as allusion had been made to a recommendation coming from him to the Society, he ought to be allowed to say a word upon the subject. In one of his articles on English agriculture published abroad he had stated that the last season was a very wet one, and that many sheep had been affected with rot. He afterwards received a letter from a person not known to him, stating that a veterinary surgeon in his neighbourhood had discovered an unfailing remedy for that awful disease. At first he paid no attention to the statement, but shortly afterwards he received another letter, still more pressing, stating that the veterinary surgeon would come to England, bring his medicine with him, go into the districts most affected, and undertake, at his own risk, to cure the sheep, claiming no remuneration if he did not meet with success. Thinking that in the presence of such an evil no suggestion ought to be despised, and knowing that the greatest discoveries of science had often sprung from very humble sources, he wrote to Professor Simonds, sending the whole correspondence, and undertaking to furnish him with a certain quantity of the medicine with which to make experiments. He believed that the Professor, under the authority of the Society, had purchased some sheep, with a view of instituting the experiments, which he hoped would prove the value or the worthlessness of the medicine.

The CHAIRMAN said that at a recent meeting of the Veterinary Committee of the Society, at which M. Trehonnais made his communication, Professor Simonds said he lived among rotten sheep, and was quite ready to institute the experiments forthwith. The Committee accordingly exceeded its powers by voting a sum of money for the purchase of a dozen sheep (hoping to have its decision confirmed by the Council), directing that half of them should be fed in the ordinary way, and the other half treated with the medicine. Of course the results could not be ascertained at once, but they must wait patiently in order to obtain them. With regard to the fashionable condiments going about, he might observe that a nobleman of his acquaintance, who was very well informed on agricultural subjects, said he had purchased some of the cattle food, which he had found very beneficial to his dairy cows and sheep.

MR. FISHER HOBBS said he desired, as a practical farmer and a Member of the Council, to move a vote of thanks to Professor Simonds for the able lecture he had delivered. He had heard him many times since he had been the Veterinary Professor of the Society, but had never listened to a lecture of such value as the one just delivered. He had no doubt it would prove of the greatest importance to the farmers of England, and he hoped that means would be taken to have it published at as early a period as practicable. His advice with reference to the use of salt and sulphate of iron would prove very valuable, and he hoped that the results of the experiments he was about to try would be satisfactory. Professor Simonds was indefatigable in his exertions, and he knew of no man to whom the farmers of England were more indebted.

MR. ARKELL seconded the vote of thanks.

MR. HOLLAND, M.P., said it was of the greatest importance that the lecture should go forth to the world as early as possible. The mischief was done in the summer, and it was essential that timely warning should be given.

MR. J. S. TURNER said that a neighbour of his in Sussex had bought 600 ewes, all of which were affected with the rot, and he believed that upwards of 500 were now dead. He knew of many other cases of the same kind within a few miles of the place in which he resided. He understood Professor Simonds to say that land, if not subjected to flood, would not rot sheep.

Professor SIMONDS: I believe that all undrained land, when you have an excess of moisture in the summer, is rendered dangerous for sheep, and that it is so because you then have these creatures being developed in an active form.

MR. TURNER said he was in the occupation of a farm in 1825; and in the month of October of that year there was a severe gale, which caused the sea to overflow his banks and flood his brooks. The consequence was, that he was obliged to dig a fresh ditch. There was a nice spring in the brooks, which he was obliged to stop and put back a certain distance,

to keep the water up, and it flowed over a portion of the land. After the new ditch was made, he let the water off again; and the sheep went in where they had been before, and had remained ever since. But at that particular time, the whole of them were affected with rot. In 1846, he remembered a case very similar to that referred to by Professor Simonds. The late Mr. Rogers, of Kingston, near Lewes, sold 200 ewes, which were driven through the parish of Shorrington, when a dog ran at one of them, and broke its leg. The lame sheep was then put into the churchyard, while the others went on to Shorrington Common. About three months afterwards, the person to whom the sheep were sold wrote to Mr. Rogers, saying that the sheep were all affected with the rot. They went to law about the matter; and before going into court, the sheep left in the churchyard was killed, and was found to be perfectly sound.

The CHAIRMAN said he believed the year 1816 was the worst year for farming in the present century; but he remembered a worse year than that in the last century. The badness of the year 1816 did not begin till harvest time; the hay was very good, but the harvest was backward, and he distinctly remembered carrying half a field of oats on the 12th or 14th of September, and the other half was not carried until November.

MR. FRERE said, Professor Simonds had spoken of the fluke in its penultimate state of transition being found on flooded meadows, taken up into the sheep, and probably undergoing its last transformation in the stomach of the animal. He should like to ask whether the Professor thought that the stomach of the sheep was the only nidus in which that last transformation took place. If there were no flukes in the island, would the generation of them come to an end? And did the cycle of the different stages of these animals depend upon the co-operation of the sheep? He wished also to ask whether the fluke found in the ox was the same animal as found in the sheep? He was under the impression that oxen might be turned into the same meadows where the sheep were so much affected, without such disastrous results.

Professor SIMONDS: With reference to the first question put by Mr. Frere, which is a very important one, I may say that it is absolutely necessary that the last stage should be completed in the organism of the sheep or other mammalian animal, otherwise there would be no flukes in the country; because it is only in the fluke form as existing in the biliary ducts, that the development of the generative system, and the perfecting of the ova take place. If then you strike at the root so that there shall be no ova, there will never be any flukes, which can only reach their high order of development in their proper nidus, the liver. They go there with the germs of the sexual organs in them, and these become completed by their development and growth. With regard to the second question, whether the distoma met with in oxen is of the same character as that found in sheep, we have no reason to believe that there is any essential difference between them, nor indeed that there is any difference between these entozoa as found in the goat, donkey, and other animals. They are all closely allied, and probably nearly identical. I think the reason why oxen do not suffer to the same extent as sheep is that they do not bite so close; that they feed on taller grasses, and are therefore, not likely to take in so many of the entozoa. Besides that, it is to be remembered that they are animals of a stronger constitution. Let me say by way of illustration, that suppose a hundred of these flukes in the biliary ducts of a sheep were sufficient to produce a broken-up state of the constitution, the same number in the system of an ox, though not positively without injury, would not be sufficient to enfeeble an animal of so strong a constitution. Then it is to be remembered, that if oxen do fail, as they will in some few instances, or perhaps in many, as in the western parts of England at the present moment, they are generally young animals that are affected.

The vote of thanks to Professor Simonds was unanimously adopted, together with a resolution that the Secretary be requested to take such steps as should insure the immediate publication of the lecture.

The lecture was illustrated by diagrams of the organism of the ox and sheep, and the *distoma hepaticum* magnified, and by specimens of the last-mentioned creature in various stages of development.

The Council was then adjourned to the 24th April.

THE COTTAGE OF THE LABOURER.

It is my lot to reside in a district where the farms are somewhat remote from the residences of our labouring population. It is true that we have within the past twenty years had many cottages built upon the respective farms by the various owners; but still we are lamentably deficient in cottage accommodation, many of our men having to walk a weary distance to and fro to labour, some from three to four miles each way, and nearly all varying from one mile to four, and then probably another mile to the place of work for the day. Talk about serfdom and slavery. Freedom excepted, is their position far worse than the poor fellow who has to rise between three and four o'clock in the morning, prepare his breakfast, eat it hastily, and be down at his master's yard by six o'clock, ready for a long day's labour? He leaves his work on the farm again at six o'clock in the evening; he commences his wearisome walk home, takes his evening meal ("his supper") between seven and eight o'clock, and then to bed. And this daily throughout the Summer; and in harvest, and hay-time he has to make still longer days. In the Winter, or for nearly six months of the year, all this dreary walk is in the dark. It is dark when he leaves his home; it is dark when he arrives at the farm; it is dark when he leaves it; and he trails his tired legs home in the dark, having all the stiles to clamber and bridges to cross by the way, and the footway for the most part soft, slippery, and muddy. Add to this, his insufficient wages are seldom good enough to provide him the common necessaries, to say nothing of the comforts which ought to pertain to the industrious labourer: his wages seldom exceed 12s. per week, and they are frequently below that amount. Verily, his position in life is no enviable one. And this is no isolated case; it is a too common one. It much needs the favourable attention of every landlord, and to these I venture to appeal on behalf of this truly valuable class of men, and I trust this short paper may not be written in vain. My wish is that many more able pens than mine would take up the subject most energetically.

The cottage of the labourer ought to be on the farm, or contiguous to it. It is unreasonable to expect a good and satisfactory day's work from a man who has these long distances to travel, shod, it may be, in hard "high lows," or clumsy shoes, perhaps with wooden soles, and with a gait none of the readiest for quick transit. And yet he is required to do it, and in piece-work he must do it, or starve. There is no help for him. 'Tis a weary, weary, daily task. He is soon worn out, and no wonder. Landlords, think of this! Have their cases, then, in your best consideration. Good farm buildings are now the prevailing fashion everywhere. All right in its place, and modern farming would progress tardily without them; but comfortable cottages, on farms distant from villages or cottage residences, are of equal if not greater importance. And

where can they be so well situate? There is room for the garden on every farm, and every convenience all close at hand. The poor labourer can enjoy the two-fold advantage of obtaining more rest nightly, and rise fresh and vigorous for work, being minus his long morning's walk. The farmer, reaping the benefit of this arrangement, would gladly pay a high per-centage for the boon.

I am well aware that on entailed or life estates many difficulties may attend an extensive outlay in cottage building. It is a trying, if not an unreasonable thing, for a man possessing only a life interest, or deriving only an annual income from the estate, to be called upon to expend a considerable portion of it for the convenience and benefit of his tenantry and his future heir. Be that as it may, it is capital well laid out, and will not only ensure an enhanced income, but a more prosperous tenantry. If, however, this should be found impracticable, by all means let Government be empowered to grant loans for cottage building, on precisely the same principle as is now adopted for subsoil drainage on entailed estates. Both are permanent improvements, and no valid objection can be made against charging these entailed estates with the repayment, provided all is done under proper regulations and inspection. A short Bill for this purpose might be passed by the Legislature based upon the Drainage Bill, which would effect every purpose contemplated, and prove a valuable blessing to thousands of poor workmen.

In respect to the cottage itself, I can only speak in general terms; but for the sake of morality and decency it never ought to contain less than three sleeping-rooms: one for the parents, one for the daughters, and the other for the sons. I need not stay to point out the evils arising from the intermingling of the sexes in cottages; our Poor-Law statistics give lamentable evidence on this head; the wonder, after all, is, that they (the cases I allude to) are not more numerous. The public papers read by all, have lately unfolded some wretched cases of the over-crowding of cottages; parents, sons, daughters, lodgers (male and female) all occupying the same bedroom. Yes! and I am grieved to say wholly unconscious of their degradation. It is a lamentable fact, that numbers of our labouring population think there is nothing degrading or unseemly in thus herding together; and frequently, if not influenced by their masters or landlords, they will fill their cottages with lodgers, despising every precaution, and looking only to the extra shilling per week paid by each lodger. It is in this particular that the notions and ideas of our labouring population require elevation; they have been so long accustomed to small, close cottages, great privations, and general commingling of sexes in one room, if not in one bed, that they think nothing of it, and it is taken as a matter of course. It was only the other day, one of my own labourers, for whom, with others, I was

building a group of four cottages, requested that he might have but two bed-rooms instead of three. He had been accustomed to crowd a numerous little family into one room, so that two bed-rooms seemed to him a perfect luxury, and to go beyond that quite an unnecessary expenditure on my part, and far ahead of his ideas of decency and comfort on the other; and this from a man quite an average of his class. In fact, he seemed to think I had wonderfully strict notions of propriety, when I told him that I should make provision for the separation of his boys and girls into different bed-rooms, and I should expect them to occupy them. So I will take this man's case as an average instance. He conducts his family well, his children are all growing up, two of his boys are apprenticed out by our charity trustees, and his daughters conduct themselves respectably. Now, this family for many years only occupied a single room about 14 feet square. No wonder that his notions of propriety are so circumscribed. It was only from the manifest unhealthiness of his home that led him to wish for a larger dwelling. He removed a very few years since, and it is remarkable how much more vigorous and healthy his whole family now are, than when they were huddled together in their little low room. In the main, poor men care but little for family comforts; their great aim being to obtain food and clothing, with which they are tolerably content.

The construction of cottages is the business of the architect and builder; but it is very gratifying to know the great interest which is now taken by our leading agricultural societies to promote improvements in cot-

tage architecture, prizes for the best plans, &c., &c., being now general. I have not much experience in cottage building, but I have some. Model cottages are all very well, and it seems commendable to build them after some approved fashion; but I have never seen any which have not been too expensive—so costly, that no poor labourer could afford to rent them. It is to no purpose to charge a poor man from 2s. to 3s. per week for his cottage. How can he pay it, and live? However incongruous it may appear, yet it is true. A poor man's cottage must be an inexpensive one, or it must be an attachment to the farm, and be rented with it; the farmer deriving the advantage from the close residence of his men, and their unimpaired vigour for each daily task. To secure any degree of comfort, the cottage should contain a living room, and cooking room, beside the three bed-rooms. The cheapest way of building them is in groups of four, six, or eight; the fewer ends and chimney jambs the better. One pump and one privy might suffice; and the piggeries could form a little row, or be built in pairs. The cottage gardens should not be less than half a rood each, and as nearly adjoining the cottages as possible. The number of cottages on the farm should be regulated partly by the extent of the farm, and partly by the kind of produce raised; stock farms requiring the fewest, and corn and root farms the most. It would form a new era in our farming, if a cottage could be appropriated for every fifty acres of occupation. On farms greatly under potato culture, even this great number would not be sufficient. We have no fear of building too many.

ADVANTAGES OF GOOD FARMING, AND HOW TO DO IT.

BY MR. WILLIAM TROTTER.

[Paper read at a monthly meeting of the Hexham Farmers' Club, February 12, 1861.]

John Grey, Esq., Dilston, in the Chair.

MR. CHAIRMAN,—When looking over the *Mark-Lane Express* a few weeks ago, I came upon the following paragraph:—"A great deal has been written and said about the science and art of agriculture, but for practical guidance the whole thing is in a nut-shell. It consists of these two rules—make the land rich, and keep the weeds down. If any person who tries to raise any plant will follow these two rules he will succeed, and if he does not follow them he will not succeed." This paragraph, so much to the point of our subject, gave me hopes that I might get clear of writing a paper, but on a little reflection I concluded that farmers have other things to do in addition to making the land rich and clean, to enable them to farm advantageously. I, therefore, have no other alternative than to endeavour to grapple with my subject, however unequal I find myself to it; and I would add, that I never undertook to write on any subject with more reluctance, well knowing that it requires a more experienced head than mine to do it justice. But having undertaken it I must proceed; and in order to give us a better view of our work it is necessary to attempt to cut away the undergrowth that surrounds it. We shall then be able to dis-

tinguish more clearly the farmers' interests from the landlords' Farming, to be advantageous, must be profitable either to the tenant or to the landlord. A farm may be well managed in every way; but the rent may be so high as to leave no profit to the tenant, or the time of his occupation of the farm may be so short as not to permit him to realize the advantage of capital he may have invested. In each of these cases the landlord will be the gainer, and the tenant and the community will have no right to complain, inasmuch as the farm is well managed. But if, on the other hand, a tenant enters a farm in high cultivation, and enriches himself by impoverishing it, or should he, by paying too high a rent, be unable to procure sufficient labour or manure, the landlord's purse would be augmented at the expense of the farm. But such farming, although profitable to the one or the other, is not advantageous. For if a balance were struck it would almost to a certainty be found that the amount so abstracted from the farm would not be sufficient to bring it up to its former state of cultivation. It, therefore, follows that farming, to be advantageous, must not only be profitable to the landlord or the tenant, but the productiveness of the soil must be kept up and partake of that continually progres-

sive improvement of which the soil is capable. For I hold that the community have a moral right that the soil be properly farmed, as they have a legal claim on all property that before rent is paid the poor man must be maintained. Having now shown what advantageous farming is, my next business is to find out why it is so; or, in the words stated on the card, "the advantages of good farming." The first result of good farming is greater crops, or an increase in the necessities of life. Abundance, which of itself is a great blessing, sets in motion a greater amount of money, which necessarily adds to the comforts of the million. Then, again, good farming necessitates the employment of more labour, which, under almost all circumstances, is beneficial. But when we are racking our brains upon inventions that have for their object the diminution of labour, it may be said that I ought not to give good farming credit on this account. Yet few of us would grumble at having good crops because they require more labour to secure them than to secure bad ones. But man ought to have a higher and a nobler motive for improving and devising machines, than that of depriving his fellow-man of labour. This excites his distrust and his discontent. The motive should be to relieve men of the drudgery of life—to make them the directors of power and of work, and not the doers. The man, who directs a machine that does his work, returns home not the passive piece of humanity we too often see, but a reflective being. Time—the want of which is the barrier against the obtaining of knowledge—is, as it were, obtained. It is the fulcrum on which must rest the lever by which he is to be raised in the social scale. The minds of men, when they are relieved from drudgery, expand. Good farming promotes this. An increased demand for labour increases its price. And as "necessity is the mother of invention," so high wages stimulate invention. Then, again, whatever may be man's motive for inventing, we may rest assured that wages will not be permanently reduced; because the very introduction of machinery so stimulates other branches of industry, that they absorb any surplus labour set free. The benefit, then, which results from the introduction of machinery, so far as £ s. d. goes, does not arise from a reduction of wages, but because machines—whether for thrashing, reaping, mowing, or for other purposes—enables us to get the work better and cheaper done than by hand. Again, an increased demand for machines tends to improve their manufacture. Thus we see that good farming produces abundance, tends to relieve man of toil, elevates his mind, stimulates invention, and improves the make of our implements. In addition to these, it improves the climate. But the most difficult part of our subject remains to be solved. I have said that good farming, to be advantageous, must be profitable. But with increasing rents, increasing wages, increasing taxes, and other increasing demands, whilst the average prices of grain remain nearly stationary, how the tenant is to obtain this profit is a question easier asked than answered. However, it must be admitted that some few farmers do make money. That they do so in a much slower way, and not to that extent that men do who are engaged in manufacturing and in commercial pursuits, or in the professions, is true. But I believe there are as few wrecks amongst farmers as amongst any other class. The causes that prevent or promote a farmer's success are numerous, alike within and beyond his control. Some are natural to his farm, others arise from the negligence of neighbours, and others from defects in our laws. I will give an illustration in each of these cases. A soil full to the surface with water cannot

be farmed profitably, neither can land adjoining badly managed woods or plantations. They are nurseries of everything that is obnoxious to good farming. I have seen young plantations in which the thistle reigned triumphant. I have seen his seed gently drifting—snow-like—over adjacent fields. The result was seen in the after crops. I need not describe it; but I imagine the farmer's character was as much injured as his crops. Again, no farmer can farm profitably in the vicinity of game preserves. I need not say why; but I cannot refrain from remarking that, of the two—the game-preserver and the game-destroyer—the former is, in my opinion, the source of greater evil. The latter has been described in this room as "an unmitigated villain." I believe him an evil, a great, but necessary evil. He is sapping the ground on which his tempter stands. A man farming under any of these disadvantages suffers more than the mere loss in his crops. However well he may plough, however profusely he may manure, his crops will dwindle away before his eyes. This mortifies him to the very core. He hopes against hope, labours indefatigably, but he cannot get ends to meet. Energy, so essential to success, gradually loses her sway, and then he stands in the world—not so much a free man as a serf. The causes that contribute to a farmer's success are, likewise, numerous, such as the geological formation on which his farm rests, its locality, its climate, but the greatest is within himself. I have said that good farming necessitates the employment of more labour, but this does not apply to all the labour on a farm. The expenses of ploughing, of harrowing, and of sowing are the same whether we get good or get bad crops, whether the farm is in good or in bad condition. These expenses, then, we may set down as a constant quantity against the farm. It therefore is self-evident that if we can, by a judicious application of purchased manures, augment our crops, that we shall be gainers in proportion as the value of the extra part of the crop exceeds the value of the manure. Good crops check the growth of weeds, the expense of cleaning land that bears good crops is therefore less than if it bore bad ones. But it must not be inferred that I give manure all the credit of good crops, nor that I attribute their failure at all times to a want of it. For to go upon a tenacious retentive soil when in a "pasty" state, whether to cart off turnips, to plough or to harrow, is, under many circumstances, tantamount to destroying the crops, however liberally it may have been manured. Farmers' incomes and outlays are so nicely balanced, that no waste can be admitted, whether of produce or of labour. It is therefore absolutely necessary to ensure success, to have all implements and machines not only constructed on the best principles, but of the best materials and workmanship. Men generally give preference to low-priced things; inferior implements are a continual source of waste and vexation. I, unfortunately, know too much about the difficulty of getting good material, and I feel that I cannot too strongly condemn the folly of screwing down implement makers in their prices. I now get a few things from Sheffield, and my instructions are, "Let me have them of the very best material, and make your prices accordingly." If we wish to possess really good implements, we must act on the same principle. It is true economy to do so. Bushels over bushels of corn are sent away among the straw to the folds by badly-constructed thrashing machines. Proof of which may be seen in green stack-tops and in green dung-hills. One-twentieth of this loss is not seen, and what we don't know does not do us any harm. In the reaping of crops there is frequently great waste. I acknowledge that

great improvement has taken place during these 20 years, but I have occasionally observed, a few weeks after harvest, that a suspicious green growth springs up where the short scythe has been used. I may mention that when we have been cutting with the reaping machine we have sometimes rounded the corners off with the scythe, and judging from the greenness to which I have alluded, I imagine the scythe sheds considerably more than the machine. Perhaps those who have used machines will tell us if they have observed similar difference against the scythe. As I have an interest in reaping machines it may be supposed that I have a double motive for what I am saying, but my business before you is honestly to express my opinions, and in doing so I am content to bear with the strictures of the critic. Mr. C. Stephenson, in his prize report, states that "he thinks farmers require too much from reaping machines." This may be, and I think it is quite true of some kinds of them, but not of all. It may also be quite true of all reapers in the hands of some men, but not in the hands of all. Any crop that cannot be cut with a reaping machine is a very rare exception. Farmers are frequently accused of being slow in availing themselves of improvements in machinery. I do not think they are so, anything like to the extent that fast writers and fast talkers would have us to believe. Caution becomes a part of a farmer's nature; and if he lacks this, he frequently runs to ruin. But I believe the more general introduction of reaping machinery is retarded by the difficulty of ascertaining which is the best. The advertisements of some makers partake more of those which are addressed to the illiterate by quacks, than *bonâ fide* addresses to respectable men. Their introduction is also much retarded by an apprehension that they require more skill to manage them than is to be found on farms; but this is a great mistake. I believe there is no work on a farm, in which a man has more pleasure, or which he picks up more easily from others, than the working of reapers. Hence the desirableness of holding public trials, not so much to tell us which are the best machines, as to let the men see each other's method of managing them. In these operations, reaping and thrashing are the greatest waste of produce. There is also frequently waste in the food given to stock; but I shall pass it by, as I may have a few remarks to make on feeding. There is on almost all farms a waste of labour arising from badly-arranged buildings, from bad roads, &c. There, is, in my opinion, more care required in the planning and in the erection of the homestead than in anything connected with the farm. It is erected, not for a twelvemonth, but for an age. One might imagine that the humblest labourer, when attending cattle, could in a few days find out where the turnips would be most convenient to him. But a house for these is not unfrequently found in some out-of-the-way corner, alike inconvenient to get the turnips to and to get them from. Two or three gates or doors to open and close, and two or three corners to go round. Turnip-carting, on most farms, is catch-work, to be done when the land is in proper order. Hence the greater necessity not to have obstructions in the way, to prevent ready delivery. The straw-barn and feeding-yards, or boxes, should adjoin each other. A vast amount of labour has to be done in the barn: its arrangements, therefore, should be as perfect as they can be made. The machine should raise all the thrashed corn to the granaries, or to a level with them. The barn-loft should be kept not so high as we see it in some recent erections. Four or five feet in extra height causes a great deal of extra labour in forking. He who designed such must be

stronger in the arm than in the brain; or, perchance, he never forked a cart of corn. Then, with respect to stock, if a man be a good judge and a good manager of it, he is almost sure to be a successful farmer, although I cannot, I am afraid, include myself in the fortunate number; yet there are a few fixed principles in the selection and in the management of stock which are beyond man's power to alter. It is desirable to bear these in mind. We may take vitality as a power which animals possess to assimilate the food which they eat. A part of this power is expended in giving action to the various organs, such as the lungs, heart, brain, and in giving heat and motion to the body. Food is, as it were, the fuel by which the power or vitality is sustained; and that which is consumed in supplying the waste caused by the creating of that power, is lost to the feeder. But, without some little knowledge of chemistry and of mechanics, such things are not very comprehensible to us. And should we by chance get a glimmering of the wonders which these sciences reveal to us, we find great difficulty in finding words to express what we but half see in a mist. However, let us place a steam-engine by the side of the feeding animal. Its parts are well-known to us, and man has produced nothing that comes so well up to the living animal as it does. We know that its power is the result of combustion. If its boiler be exposed to cold winds, its power is reduced by the waste of heat, or an increased amount of fuel must be supplied. The cold winds affect the animal in a similar way. Again, a part of the engine's power is absorbed in giving motion to its various parts. So it is with the animal. Then the more work an engine has to do the more fuel it must have. The same with the animal; the more it is disturbed the more food it requires, or the less will it gain in weight. Now, if we give no more fuel to the engine than is necessary to make up for the waste heat, and to keep in motion its working parts, we shall not get any available power. To keep it going under such circumstances would be a loss, according to the amount of fuel burnt, and the wearing out of its parts. It is the same with the animal; if we give it no more food than is necessary to make up for the waste heat and to keep in motion the organs, it cannot grow; and we had better be without it, as all that food it eats is lost. But whatever fuel we give to the engine or food to the animal above these quantities gives effective power to the one and increased size to the other. Here the similarity ends. The animal has brains, to keep which in action requires great power, that is, thinking requires power, and therefore causes waste. Hence it follows that if we desire to get the maximum amount of benefit from the food consumed, the cattle must be kept warm and quiet both in body and in brain. I have no time to say anything about the selection of animals, notwithstanding that it is a most important thing, but I might say that, as a rule, we find the cattle we rear do best. Neither have I time to discuss the merits of cattle *versus* sheep; nor to say anything respecting the different sorts of food. I now have a few more words to say about purchased manures. When I spoke of it before I made no allusion as to where we should obtain the supplies. It is a rule in commerce that "demand creates supply." With manure, this has generally, so far, held good; but at present, I believe, the demand is in excess of the supply. Even the demand is far short of what it ought to be. I should not like to calculate on applying much less than twenty shilling's worth per annum per acre over the farm. But it is stated that the average, throughout the country, is some 3s. or 4s

per acre. It would be mere waste of time to speculate as to where or how we should be able to get five or six times the quantity that is being applied. But when millions of pounds worth are being annually washed out of our towns into the ocean, our case is not hopeless. Men with great minds are endeavouring to find out how to make this immense waste available. Still, I am afraid, if it be permitted to continue, a day of retribution will come. We cannot disarrange the laws of nature without injurious results; and that it is a law that all vegetable and animal remains, in whatever shape, should be returned to the soil, is too evident to admit of doubt. I again advert to ploughing. When I before alluded to it, I said nothing about its quality. I advocate deep cultivation. Ploughing on nine-tenths of the land is barely an apology for it. But the advantages of deep cultivation are about to be shown to the world by the steam-plough. Smith, of Woolston, has used steam for the last six years, and his Swede turnips were above thirty-five tons per acre this autumn, grown without any purchased manure. A double crop at one-half the expense gives a four-fold advantage. Astounding as is the result of Mr. Smith's system, I anticipate as great things from that of Messrs. Fiskien, with less costly machinery. I know there are some sceptical about steam-cultivation. Such is the case with all things, when new. When a post-chaise approached, for the first time, a secluded village, I forget where, the natives were in the greatest state of alarm. It was dark; it had its lamps lit; and they took it for some great monster, with glaring eyes, which was about to devour them. Not so many years ago a man, on seeing the Wylam locomotive approaching him, made his escape across the fields, from a conviction that he was about to encounter a terrible devil. There is nothing so frightful about the steam-plough. When the above locomotive first commenced to run, horses were frequently sent with it, to give it a pull in case it should go wrong. That is not so very long ago, but we can scarcely grasp in our minds the immensity of work the locomotive is now doing nearly all over the world, not more in carrying loads than in over-running prejudices. I anticipate a success from steam cultivation equally crowning. Knowing how much farm work depends on the weather, I ought to take it into consideration, but seeing the subject of meteorology on the card for discussion, and in able hands, I gladly pass over it. I have said little about rent, and nothing about leases. We have had so much of the latter that I am willing to let them alone. But as rent

may be taken for the time being as an undeviating annual amount of outlay, it naturally follows that in whatever way we can increase our crops, that increase will be a clear gain so far as rent goes. If we adopt the best machinery for increasing our crops and for reducing labour, and apply manure so as to increase our crops 5s. or 10s. per acre, we may be told every penny of it will be added to the next taking of the farm. And just in proportion as the farm has improved up will go the rent. I grant this, but we must bear in mind, that if we do not succeed with good and energetic management, we cannot hope to do so by an opposite course. We seem to have no control over rents, and to stand still because landlords get the lion's share of our improvements is not good logic. If we do not move, our country will stand. We may be asked, "If the whole country was farmed as the advocates of high cultivation desire, would not the increased produce thrown into the markets reduce the prices, and consequently our profits? This is perfectly true; but the whole of the population would be so much benefited by the increased abundance that farmers could not but partake of the general prosperity. Bear in mind that thousands over thousands are not half-fed and half-clothed. I know a vast amount of this arises from improvidence, and from a want of frugality. But even one well paid labourer, with his 20s. per week, has not more than a sufficiency to keep his head above water, if he should have a wife and four or five children. How are the poor creatures to live who, in many parts of England, receive not more than one-half what our men receive? Bear in mind, too, that according to Caird, we are—not yearly, not monthly, but daily—consuming the produce of 10,000 acres of corn, in addition to our home produce. Little danger, then, of over-glutting our markets, especially with a population increasing at the rate of 300,000 annually. You will have observed that I have said nothing about the different sizes of farms; nor can I say much. I have not been able to discover that large farms have much advantage over small ones, I admit the tendency is to the increasing of size. I see some evil in this, but it partakes of the general tendency of the age—which is the collecting of wealth into heaps, and of population into dense masses. What the end of it may be it is impossible to divine. It is a transition; but if be a continually improving transition, so much the better. But I would beg, in conclusion, to add, that He "whose the earth is, and the fulness thereof" has said, "Cursed be he who layeth field to field."

DEFICIENT TIMBER SUPPLIES.

Largely as iron is coming into use for building purposes, we cannot do without timber. Our indigenous supplies are becoming more and more deficient, as might be expected, as the land is now highly and extensively cultivated. In this there is nothing to regret, for it is cheaper and better to import timber than to grow it. The land can be far more usefully and profitably employed than under forest. As respects the Government forests, they scarcely cover the outlay and labour bestowed upon them. In the notes on the trade and commerce of the United Kingdom, given in the catalogue of the woods exhibited in the British section

of the Paris Universal Exhibition in 1855, the gross value of the timber in England and Wales was estimated at from 40 to 50 millions sterling. In the total area of the royal forests there are 122,622 acres, and 51,612 acres besides are enclosed for the growth of timber. The entire extent of Woodland in Scotland is calculated at about 1,000,000 acres. Ireland is comparatively destitute of timber. In ship-building about 40 cubic feet are required per ton for the hull and fittings, so that a ship of 1,000 tons requires 40,000 cubic feet. In the United Kingdom and Channel Islands about 250,000 tons of mercantile shipping are

built annually, exclusive of the vessels of war. There are nearly 6,000,000 tons of merchant shipping at present registered in the British Empire. To keep these and our royal navy in repair, and to build new vessels, must draw heavily upon the forests of the world. The scarcity of good oak, especially for naval timber, is almost alarming, and the cost of it beyond all bounds. The Admiralty find, therefore, they must seek in new quarters for supplies, and must be more economical with their best timber. It is the same in France and America. Fortunately for Great Britain, she has many distant possessions where plentiful supplies of building timber are to be had, and to these increased attention is being turned. New Brunswick and Canada, British Guiana and British India, Tasmania, New Zealand, and Vancouver have vast forests of excellent timber, well suited for the purposes required; and to these attention should be rather directed than to our own forests, which are quite inadequate to produce any quantity; indeed, the sooner some of these are disforested the better. The annual expenditure on the royal woods and forests amounts to £53,000, and the receipts are only £4,000 to £5,000 beyond this. From these forests only about £12,000 of navy timber is obtained annually, chiefly from the New Forest, Dean Forest, and the High-meadow Woods.

Trees, too, are a marked desideratum in France, especially for shipbuilding. Ever since the revolution of 1789, which was followed by the subdivision of land into innumerable small holdings, forests and woods have yielded more and more to the axe; and no new plantations having taken their places, the country is becoming gradually denuded of trees. Already, independently of about 10,000 acres which have been planted by a society, a great insurance company and several large capitalists have turned their energies to the subject; and the President of the Association of the South is covering about 25,000 acres with seedling trees; which will prove one of the most extensive forestal improvements in France.

In British Guiana the woods for building and other purposes equal those of any other part of the world: 115 described kinds are enumerated. The fitness of these timbers for naval architecture is remarkable. Sir Robert Schomburgk says, of these, the green-heart, the Mora and the Souari are, of all the woods, the best adapted for shipbuilding. Within the last twelve years a large quantity of the green-heart has been sent to Liverpool and Greenock; and persons interested in shipping have pronounced it, after ten years' trial, to be superior to oak for strength and durability. It actually commands a higher price; and is now one of the approved woods on Lloyds' Register. Had these woods been known and extensively used in the royal dockyards fifteen or twenty years ago, it is the opinion of competent judges that dry rot and Kyan's patent would not have been much heard of. And, not to speak of the rapid decay of vessels built of English and African oak, and the consequent repairs, how great would have been the saving to Government! British Guiana is able to furnish the finest and most lasting

timber in the world, and in quantities sufficient to supply all the shipbuilding establishments in Great Britain.

But it is not British Guiana alone that can come to our aid. Tasmania has recently put in her claim, and has sent forward most excellent timber suited to many constructive purposes. The Mora trees of Trinidad have also lately been brought under the notice of Government. All these are admirably suited for shipment—an important element in their commercial value.

Austria possesses a vast amount of timber, which her Government wisely seeks to turn to the most profitable account. Unfortunately, the best kinds are yielded by the most mountainous districts, from whence the difficulty and cost of removal are very great; and it is an acknowledged fact that the same sort or species of tree, whether oak or pine, which affords most admirable wood on the poor soil of the elevated mountains, is nearly valueless, except for firewood, at the foot of the hills, and in the accessible plains, where there is a richer soil, washed down from the high ground, and a far warmer climate.

The Austrian empire is clothed with forests, which annually furnish seventeen millions of cubic "cords" of wood of all descriptions. In some provinces the country is almost wholly covered with trees; in others the proportion is small. This circumstance, combined with the different prices of labour and the irregularity of demand, causes an extreme disparity in the value of wood in various parts of the Austrian empire; so that while timber is extensively exported, it is also largely imported from Switzerland and Piedmont. The average value of the yearly export of wood of all kinds for building, &c., in logs, beams, planks, &c., exceeds one million sterling. Ship-building is conducted principally at Trieste, Venice, and Fiume, with a steadily increasing activity. The annual value of ship-building in Austria is estimated at £120,000, besides some thousands for repairs. The Austrian oak is allowed to be superior to all others in dimensions and quality. One section, from an oak 64 years old, shown at Paris, measured three feet in diameter, and elicited the admiration of ship-builders and engineers of all nations.

Austrian fir is equally valuable as Austrian oak. The establishment of railroads causes an immense demand for timber: each sleeper measures three cubic feet, and one mile of single rails requires 8,000 sleepers, which lasting on an average five years, gives a yearly demand for 1,600 sleepers, or 160,000 sleepers for every 100 miles. Austria, like many other European countries, is always laying down new railways. The Austrian Government takes measures to secure the national forests—those sources of the empire's wealth—and the example should not be lost to Great Britain; for in many of the British colonies, especially the North American ones, fire and the axe commit wholesale destruction upon the forests, without any regard for the future, which should have a thought, as well as the present.

AGRICULTURAL LABOURERS AND PEASANT FARMERS.

It is a noteworthy fact, that at the present time the agricultural labour question is exciting attention if not anxiety throughout the civilized world. It is earnestly discussed by employers and by landowners living under every form of government.

The pro-slavery demands, which have broken up into at least two hostile republics the lately "United States," are founded on the labour question. The emancipation of the serfs of Russia, lately decreed by the Emperor, in spite of the remonstrances of the territorial aristocracy of that empire, has been finally and suddenly decided upon, because the Government felt that the serfs were rapidly losing their ancient habits of religious obedience to their masters. If we turn from the pure despotism of negro-cultivated America, or serf-cultivated Russia, to France—where, in everything that concerns land, the most perfect equality reigns, where a forced division of property has made minute farms the rule, hand labour essential for almost every agricultural operation, and the evils attributed to large farms and the full employment of machinery under the care of day-labourers impossible—we find the complaints of the want of labour louder and more bitter than even in Ireland and Scotland. The cry comes, too, not only or chiefly from the employers who desire to introduce the English system of large farms, cultivated as much as possible by horse power and steam power with hired labour, instead of produce-paying (*metayer*) tenants, but from the peasant farmers—the owners of little freeholds, who complain that their sons will no longer obey them or stay with them. A most extraordinary correspondence on this asserted evil has found a place in the two last numbers of that eminent French periodical, the *Journal d'Agriculture Pratique*. One correspondent goes so far as to suggest that laws should be enacted for keeping full-grown sons at home, and making them obey their father and grandfather. These complaining peasant-proprietors live in their own houses, on the produce of their own freeholds. No laws of entail or primogeniture, on "grinding, land-grasping landlord"—none, in fact, of the stock landlord-legislation crimes of the Manchester orator stand between the cultivators and perfect happiness. And these protests against the disobedience and migration of sons from the paternal dwelling or native village are published soon after that singular account of the depopulation of large agricultural districts of France given in a cotemporary agricultural journal, as an answer to explanation of advertisements inviting English farmers to lease or purchase vast tracts of unoccupied land in the Empire of Equality! It seems, if we are to believe what we read in French journals, that this depopulation of the agricultural districts, and influx to towns, is going on at so rapid a rate, that the employers of labour are reduced to the delusions of despair. For instance, they write essays for the benefit of ploughboys and ox-drivers, showing the superior health and happiness of a country life—a great waste of ink and paper, according to our experience in England, in Ireland, and in Australia, where eloquent speeches and leading articles against emigration, and against departure from shepherding to the gold-fields, were profusely expended, without the slightest effect. We none of us pay much attention to advice which seems chiefly prompted

by the self-interest of the adviser. Who ever persuaded a school-boy that holidays were baneful, or mince-pies unwholesome?

In Ireland it is the attractions of America and Australia, the pressing invitations accompanied by solid reasons in the shape of bank post orders, that tempt the peasantry away from rising wages. In England and Scotland it is the easy conveyance, and the rapid communication of knowledge more or less useful, that seduces the strongest and cleverest labourers to leave our manufacturing employments; and nothing but stronger counter-attractions will retain them. But we feel confident that in England these attractions will be found. It is nearly ninety years since Arthur Young, so sagacious on most subjects, said without effect all that is to be said against the migration of countrymen resorting to town. It makes us smile to read that

"Giving the power of expeditiously travelling depopulates the kingdom. When a stage-coach was four or five days creeping a hundred miles, the fare and expenses ran high; but now a young fellow jumps on to a coach-box, and for eight or ten shillings gets to town by night. The numbers who have seen London are increased ten-fold; of course ten times the boasts are sounded in the ears of country fools. Formerly the small-pox hung in *terrorem*, and frightened millions at the idea of London. In a year or two there will not be a lout in the country who has not been inoculated, from which moment all bars are removed, and he flies to London."

And in another place Arthur Young proposes to

"Finish the enlargement of the capital, the over-grown size of which is pernicious to population; to lay a tax on all servants kept in London; to retain tax on coals in London, and repeal it elsewhere, as well as the taxes on salt, candles, soap, leather, beer, and tea, and replacing the last by an excise on the houses where it is drunk." "This excise tax," he says, "should be aimed at the poor; for unless tea-drinking is put an end to, no great plenty of necessaries can arise."

The taxes Arthur Young condemned have all been repealed except that on tea, which yields in duties and trade more money and trade profits than all the rest. In other most important instances the advice of this great and wise man has been followed. Ireland has been "united to England." "New poor laws" have been passed. Tithes have been "commuted," and with the best effects. But although compulsory vaccination has replaced optional inoculation, and the swift, easy, cheap travelling of railroads has swept away the coaches he condemned, London has not only increased fourfold in extent, but become the market where most kinds of food and clothing may be purchased more cheaply. It is not the competition of London that our employers of agricultural labour fear, but of those steam-driven manufacturing districts, the best customers for agricultural produce, which have started into importance, since Arthur Young advised and prophesied.

One of the panaceas from time to time propounded, for restraining agricultural labourers from migration is the creation of small farms, whereon young labourers are to be bred. The proposition assumes various shapes, according to the views and education of the speaker. In England, since the ruin of the occupiers of Feargus O'Connor's "Freehold Land" farms, it is seldom heard of, except in one of Mr. Bright's speeches, when he desires to make a town audience believe that the laws of primogeniture and entail debar mechanics and factory hands from advantageous investments and pleasant

occupations; but these passages never produce more solid effect than a cheer, because, in reality, a country life has no attractions for an English mechanic, unless it be in the shape of a suburban garden; and the agricultural labourer, sharp enough to have ambitious aspirations, either becomes a navvy or a drainer or a mechanic, or turns to buying and selling—the most profitable of all pursuits, for a man gifted with bargaining talents. In Scotland—where the law of entail is much more strict and much more commonly put in operation than in England; where towns are said to be so beleaguered by entailed estates, that building sites are not to be had, when most needed, at any price; and where, too, in certain purely rural districts where mountain pasture is to be had—the intensely frugal people can really live on their oatmeal, with the help of a cow's grass—the cry for small farms seems more really popular. It is taken up by eloquent clerical agitators—and the editor of a Scotch agricultural journal sometimes writes as if he would like to see an army of cottager-farmers dotted over these damp, mountainous districts, whence, at the cost of much heart-suffering, they were removed more than thirty years, and replaced by sheep. One of the clerical orators has even demanded a law for compelling landowners to sell their land in small lots. A wild notion, only worth notice as showing the degree of irritation which prevails in Scotland on the subject of land.

At the great Edinburgh labour discussion meeting, it will be remembered that the agent of an estate in Annandale reported favourable results from a system of leasing for nineteen years, to middle-aged labourers with accumulated capital, plots of land for building dwellings, with grass for their cows. These leasehold tenants were found to be the parents and guardians of a very well-trained class of farm servants. We should like to know how these cottier farmers live—that is, what is it that satisfies them in food and clothing, and by what means they get the money returns, the amount of which is important, if a cottier farmer is to be better off than a day-labourer. In England, for many years past, our experience of cottier-farms has not been encouraging; probably because the habits of the people are too expensive for success. The more favourable specimens were to be found where good pasture enabled dairying to be carried on, in conjunction with handloom linen-weaving, as, for instance, on the Middleham estate, near Manchester. But you cannot get a cottier's son to be content with bread, butter-milk, and potatoes, when he begins to associate with factory-hands and mechanics, who live on beef and beer; and unless a cottier farmer has money saved by frugal living, the first unfavourable season ruins him.

Every year it becomes more plain that, in our modern highly productive, highly artificial system of agriculture, a farmer must make his profits on an average of several years. Few English or Irish cottage farmers are prepared to do this. On a considerable estate of cottage farms near Cirencester, through which we recently passed, it is said that the people live famously when they get their crops in, and are pinched for all the rest of the year. A medical man reports that there is a considerable excess of sickness amongst these cottage farmers over the farm-labourers of the same district. There are, no doubt, special circumstances under which small farms alone render agricultural tillage possible—for instance, in colonies, where labour is dear, and land cheap; there are other cases, as in Guernsey, Jersey, and parts of Flanders, where the cottage farmers maintain their position, although they originate no agricultural improvements. But as a general rule, Arthur Young's maxim holds good: "Great farmers are rich farmers;" and "good culture means much labour," which can only be spared in bad

times, when perhaps most needed, by a man of capital, who can live on an average of years.

As it is most probable that whenever, from any cause—a diminution of the American supply of cotton, for instance—the working classes of towns suffer from temporary distress, political agitators will be found attributing that distress to the laws, and customs more powerful than laws, which regulate the distribution of land in England, it will be useful to give, before a hot, passionate discussion arises, some account of the district where minute division of property has been most largely and successfully practised.

The Russian Government, having had the emancipation of the serfs forced on it by necessity, has acted wisely in securing to every serf the hut he lives in and a few acres of ground—enough to afford him and his family a bare subsistence. As there are great difficulties in the way of markets for produce in the interior of Russia, as many of the landowners will not have the means of paying money wages to all their emancipated serfs, as a system of poor laws would not work in a country where money is so scarce, this measure is, perhaps, the only expedient possible for emancipating the serfs, without creating a nation of dangerous paupers. The framers of this law, confiscating a large share of the estates of the nobles, hope and intend that, by degrees, the serfs may learn to work for wages on farms, as they do now as mechanics in towns, and that the little lots of land will do for the state what workhouses and poor-rates do in England—afford a living for the unemployed and able-bodied.

In England there is no objection to a working man purchasing a few acres of land and cultivating it: that even now is easier, because land is cheaper than in France. But there are solid objections to encouraging a system of small farming, either by laws or by public opinion, because not only would a district of small farms, whether freehold or leasehold, according to all the evidence we have before us, produce less surplus saleable food over the consumption of the family of cultivators than a farm cultivated with the rotation, the machinery, the horse-power, and the outlay of capital possible where agriculture is conducted on the average scale of English farms, but such a district would be a permanent bar to agricultural improvement. The land of England being held as a matter of security and dignity—as much, at least, as a matter of profitable investment—those tenants are preferred who put into the land at least as much as they take out of it, to others of less capital and less expensive habits. This is the reason there are so many applicants for a farm to let on any great hereditary estate. A farm on a rich peer's property is looked upon as a boon—a favour bestowed—a something equal in value to an annuity. An examination of the history of the progress of British agriculture shows incontestably that all great improvements in live stock, in the use of machinery, in the use of manures, and in draining, have been originated and forced on, in the face of the obstacles of prejudices and partial failures, by great tenant farmers and great landlords. The peasant farmer's whole time and attention is engrossed in living and saving by halfpence; he has neither time, nor money, nor patience for the experiments that must precede great improvements. An ordinary English farmer thinks long before he invests five or six hundred pounds in the great invention, the revolutionizing invention of the age—steam cultivation! but a peasant farmer has to hold many a consultation with his treasurer—his wife—before he invests in a steel digging-fork to cost half-a-guinea.

The country called in history Flanders, at present included in the kingdom of Belgium, presents the most favourable aspect of peasant cultivation. Even in that country we find two

distinct divisions: where the land is a stiff clay, the farms are large; where the soil is light, silicious, easily worked with a spade, what may properly be called garden cultivation prevails, from the size of the farms and the character of the crops.

We condense the following account of an interesting people and district from an admirable paper recently contributed by M. Emile de Laveleye to a French periodical ("Revue des Deux Mondes"), which occupies the position in the French-speaking countries of our two leading Quarterly Reviews.

"We are in Waesland, in Eastern Flanders, on the north of the river Scheldt, between Antwerp and Ghent. The first appearance is of being in the midst of a forest; all the roads are planted, all the fields are surrounded, and all the ditches are bordered with trees, which, driving their roots into the one side, and the muddy water of the great drains on the other, display a most refreshing appearance of fresh growth. There are no hills to break the monotony of the flat, fertile, peaceful plain. At intervals along, and parallel to the road, the farmhouses rise from the midst of orchards of great apple-trees. Tacitus observed that "the Germans lived in detached dwellings, unlike the Latins, whose villages are formed of rows of houses," and his picture is here to this day. The farm-house is low, of one storey, built of bricks carefully painted white or of some bright colour with the shutters of a deep-green. The roof is thatched. A path paved with bricks leads up to the door through a garden gay with dahlias and gilliflowers, and through the white curtains of the windows may be seen the bright colours of the pot-flowers, which the latest horticultural shows of Ghent have made the fashion. The cottage generally consists of four rooms, the largest being used as the living-room; in the second butter is made and the food of the cattle cooked; the two others are bed-chambers. Scrupulous cleanliness and neatness prevail not less in the hut of the poor labourer than in the house of the rich farmer. The ancient furniture—the oak-cased clock, the wardrobe, the white wood dresser—all show the care of the housewife. Plates gay with flower-pictures adorn the mantel-piece of the grate of the huge fireplace and the shelf of the dresser. The iron-work of the churn and the copper vessels shine brightly in the sun. The walls are whitewashed every year before the fair (*kermesse*). In the farm-yard everything is equally neat; the dunghill and liquid-manure pit are under the roof of the cow-house. There, too, five or six huge cows with swelling udders are sedulously attended on by the farmer's wife. In summer they get plenty of green cut fodder; in winter, straw, hay, and a sort of hot soup of turnips, carrots, beet-roots, oilcake, bran, and rye flour or malt. The agricultural implements in use are a light swing-plough, drawn by one horse; harrows of a triangular, rectangular, and parallelogram form; barrels mounted on wheels for distributing liquid manure. But the special implement of the Flemish agriculturists—the implement with which he has fertilized sands, drained marshes, and reclaimed thousands of acres from the sea—is the spade. They have a proverb which, as written, is almost English—"De spa is de goudmyn der boeron" (the spade is the gold-mine of the boor or peasant). The spade of the Waesland, intended to work in a light, well cultivated soil, is of wood, with an iron casing on the blade. Even on very small farms the plough is used as well as the spade; but the spade is employed to give the last finish to the preparation of the soil, to throw it into heaps for winter's frost to soften it, or into beds two or three yards wide divided by narrow channels. The fields are invariably of a regular shape, square or a right-angled triangle, and seldom more than $2\frac{1}{2}$ acres in extent. The arable land is thrown up in the centre, and slopes to the sides, so that water

may flow from it evenly. On each side of the arable land, but a foot lower, is a border of turf ten or twelve feet wide; still lower is a plantation of under-wood, which is cut every seven years. Lastly, the field is enclosed by a ditch, bordered with forest trees. The arable land is on an average seven feet higher than the ditch. This helps to make it perfectly dry. These ditches are indispensable, in a low flat damp country, to receive the rainfall. In cutting them, the "spoil" is used to raise the level of the arable land. Thus each enclosure supplies annual crops—grass, which is watered by the overflow of liquid manure from the arable land—fire wood every seven years, and timber fit for building every thirty years. The arable land is usually worked with the plough; but every six or seven years it is dug over, the subsoil being carefully spread over the surface which has borne the last year's crop, the subsoil being supposed to have had the benefit of a fallow and the filtration of the manures applied to the surface. The consequence is, that arable land acquires a greater depth than even that of vegetable gardens. The chief produce is not grain, but flax and butter. The best farmers do not sell any corn—they give it all to their live stock.

Rye and potatoes are grown on the poorest land, and form the principal food of the agricultural classes in the greater part of Flanders. The Germans are so fond of rye, that they cultivate it in preference to wheat, even on strong clay land. It also yields in Flanders, where the soil seems particularly favourable to it, upwards of ten per cent. more than wheat; it ripens earlier, and thus leaves more time and room for the stolen crops, which form a leading feature of Flemish peasant agriculture; and the straw is preferred for thatch. Wheat requires much manure, and often does not pay the expense of cultivation. Wheat, therefore, is chiefly confined to the district of strong land and large farms. Barley yields an excellent crop, and beer is the drink of the country. Potatoes occupy ten or twelve per cent. of the arable land. Oats are a favourite crop. Buckwheat is liked, because it requires no manure. In the sandy and small farm regions, 35 or 40 per cent. of arable land is employed in growing green crops, either as a first or second crop. These, with the natural and artificial meadows, give a return of more than half the land devoted to crops which yield meal and manure. Without a liberal application of these, lands would soon return to the condition of waste heaths. Artificial fields of lucerne have not succeeded. Common clover mixed with rye-grass, and red clover, are used instead. The damp climate suits permanent pasture; but the soil is generally too poor, in the region we are particularly describing. Formerly the cottage farmers not only grew flax, but spun it with distaff, and wheel, machinery has absorbed that employment; but the retting, the stripping the flax plant, weaving the thread, distributes a considerable sum in wages amongst the labouring population. The decline of the linen trade has been recently compensated by a great export of linen thread to England and France. The cost of flax growing, in manure, labour, and seed, is calculated at about £13 an acre. Every farmer grows tobacco for his own consumption. But in certain districts a very fine quality is obtained.

Hops are cultivated with great care and success. They water with liquid manure as soon as the leaves begin to grow yellow. Unlike our hop districts, where everything is sacrificed to one plant, the finest crop of wheat and roots are found in the hop districts. Amongst other crops, chicory, used instead of coffee, rape, and other plants, are grown, to make oil and cake. The number of stock maintained per acre is large, but mere figures convey a very imperfect impression on this

point. M. de Lavergue's calculation has 33 horned stock, 6 horses, and 200 sheep for every 2½ acres in England, and in the whole of Flanders 55 horned cattle, 12 horses, and 8 sheep. The French author reduces the English sheep to cattle at 8 to 1, and this gives 64 head in England to 68 head in Flanders per 2½ acres. But he also observes that the cattle are chiefly for the dairy; that, "in consequence of the want of pasture, and the very small consumption of meat by the working classes, very little meat is grown—except in the large farm district of the coast;" and that, "while the number of sheep diminishes, a great number of goats—50,000 in the province—are kept by farmers too poor to keep a cow." Since the demand for butter for export to England has so largely increased, the number of sheep has steadily diminished. The French author labours under the erroneous idea that the same result has followed high farming in England; but we all know that the reverse is the fact, the number of sheep fed having steadily increased in England for the last ten years.

It must also be observed that any comparison between the stock fed in England, and on the continent, will be very deceptive, if taken in the usual manner by numbers. Our live stock are so much heavier, so much more valuable to the butcher, and so much earlier matured, that it is no exaggeration to treat them as worth double the live stock of France, Germany, and Flanders—although in dairy-produce Flanders and Holland excel us, not from the superiority of their stock, but the superiority of their management, and, in certain districts, of their grasses.

It will be seen, from the preceding sketch of the Flemish peasant farmers, that they depend greatly on dairy, and the domestic manufacture of green flax into thread, two pursuits eminently suited for cottage farmers, and which, if the habits of the people permitted, might be advantageously copied in Ireland. But there are special aptitudes in different races, which it is very difficult to transplant. If it were not so, Flemish agriculture would long ago have made its way into France, where, according to a large mass of reliable evidence, the condition of the peasant proprietors continually deteriorates, in spite of the gigantic efforts of the Government to improve their practices and their condition. But it cannot astonish any one who has been familiar with the chronic and offensive misery of French agricultural villages, that the young men, in spite of the entreaties of their friends, their fathers, and their employers, emigrate in crowds to the great towns. The villages of the Flemings are more attractive. Nothing can be more charming than the following picture:

"The Flemish village is not formed of a collection of farm-houses (as in France), but of the trades supported by the numerous population dispersed over the fields. The prevailing feature is humble, unpretending neatness and close economy. Near the church, whose spire springs from the tree-planted grave-yard, is usually a square formed of houses, all in the cleanest possible order.

"The cottages of the labourers are usually to be found spread over or near each farm. Near at hand is the parson's house, with its garden surrounded by a wall or trim hedge. Next comes a building, not without architectural pretensions, which is the communal or district school, and sometimes a school for teaching weaving; and another surmounted by a clock-tower and cross, where a religious community instruct the girls in lace making.

"In almost every 'commune' country houses are seen, where green lawns dotted over with trees remind one of English country-houses on a small scale; but mansions are rare, the feudal aristocracy having never held a high position in a

country ruled by the great linen-cloth manufacturers. Flemish agriculture owes nothing to the higher classes.

"The distinguishing feature of rural Flanders is, that every village is the centre of local enterprise and association, quite independently of the chief towns of the province. The spirit of association peculiar to the Flemish race creates societies of every kind everywhere, for the promotion of amusement or some useful object. Musical societies, societies for giving prizes to local poets, and for local trotting matches, or to farmers who ride at the ring with a lance, as they did in the middle ages; agricultural societies, and bowling and cross-bow shooting clubs. These last are ancient guilds, with coats of arms and banners, some founded on charters dating from the 13th and 14th centuries, and bound to meet at the call of their Suzerain. Their rules, their expenses, their days of meeting, all are discussed, and all help to give the Flemings the habit of transacting public business."

Certainly this is an attractive picture of a state of rural society of which we have no parallel; but when we turn from the poetry to the prose of figures the result does not present anything very tempting to our English mechanics, or even our best paid and lodged agricultural labourers.

The author, from whom we have already quoted, says of the large farmers of the clay soils: "They eat wheat bread every day, bacon several times a-week, and beef on certain great occasions. They are generally well-clad; their wives are often dressed elegantly in their ancient and picturesque costumes. But the small farmer lives chiefly on rye bread and potatoes: he drinks chicory for coffee, and uses the coarsest produce of the beetroot for sugar; beer he reserves for fairs and feasts; he never eats meat, and seldom bacon. It is calculated that he does not get above three per cent. on his capital, beside his wages as a labourer, and he and his family all work in a manner almost unknown in other countries. As for the hired labourer, he works and receives less than any other labourer in civilized Europe. His wages are from 10d. to 11d. a-day, and he only exists from the incessant toil of all his family. When the day is over, he toils often far into a moonlight night, on a few rods of land he rents near his cottage. His wife and daughter work at lace-making; the sons not fit for field-work collect weeds and grass from the roadside, and feed rabbits for the London market. They skin them before selling them—the skins being used in Belgium in the manufacture of hats."

Still, it must be admitted, that hard as the life is, the Flemings seem to prefer rural to town life. That may be greatly due to the "*Societies*" and "*Guilds*." A careful examination of the condition of cottage farmers in Ireland and in Flanders as tenants, in France and the colonies of England as freeholders, in Switzerland and the Channel Islands as freeholders as well as tenants, brings us to the following conclusions: Wherever, as in newly-settled countries, land is plentiful and cheap, labour scarce and dear, there agriculture can only be carried on by the hands of the settler and his family. In the demand for labour that surrounds them, they have a resource when they need cash or wages in any form, and they will rise and prosper as the value of their land rises. Wherever labour is abundant, and not in demand, and markets are so distant that there is no daily money-price for agricultural produce, there a bit of land to grow food is essential to the existence of the peasant.

Wherever there is a steady demand for agricultural labour, at wages which rather increase than decline, there the peasant, with a good cottage and garden, lives better as a labourer for hire than if he worked for himself.

The Flemish farmer, paying a heavy rent for his little plot of from five to twenty—seldom thirty—acres, on which he invests a capital of about £4 an acre, lives better, and cultivates enormously better, than the French peasant-proprietor. But he grows very little corn, and no wheat for sale. The Irish cottier grows little or no corn. The Swiss, whose frugality rivals that of the Flemings, do not attempt to grow corn; and their prosperity and comfort depend on dairy manufacture; on a short, hot summer; on the natural grasses of their valleys; on extraordinary self-denial and frugality; on domestic manufactures, such as watchmaking; and on an influx of capital from returned emigrants and the visits of travellers. The peasant-farms of the Channel Islands are dairies and gardens, cultivated in a district where there are no taxes; an unfailing, cheap supply of manure from the sea; the advantage of a great market, with cheap conveyance to England; and a large military expenditure, besides that of settlers attracted by the advantages of neither taxes nor Customs' duties.

From time to time, we hear a story of the wonderful suc-

cess of some man who, with a spade and an acre or so of moorland, has raised himself to independence. On investigation, it always turns out that this is a man with great talents for buying and selling, and great capability of work. Such a man, if near a market, and near a road or other resource for manure, will often turn a bit of barren moor, that would ruin a capitalist, into a garden. Such special men will be best helped by a reform in our costly system of land laws. Make conveyancing cheap, so that to buy a garden will be nearly as easy as to buy a cow; and all will have been done in England that can be done, to assist the land-investments of the labourer. In this country, corn is the paying crop; and in no country of peasant-farmers can a surplus of corn be grown.

Kitchen-gardens and dairy-farming are open to small proprietors; but to feed the people of England, we must have large farms, large fields, well drained, not overfed with game, and tilled by labourers well housed and well paid. Very soon, the law of demand and supply will secure the two last requisites of first-class cultivation.

THE STACKHOUSE HERD OF SHORTHORNS.

Sir,—Having recently paid a visit to my friend Mr. Carr of Stackhouse, I have thought it might perhaps be interesting to some of your readers who don't like to travel about in search of good Shorthorns themselves, but are always pleased with information which tells them where good Shorthorns may be seen, if I were to put down, while the impression is still fresh upon my mind, the opinion I have formed of the Stackhouse Herd. Such notices, from various quarters, have been of considerable use to myself; and I trust that the review which I in my turn am about to contribute, with as much judgment and impartiality as I possess, may be equally fortunate in proving beneficial.

Mr. Carr entered upon the pleasing occupation of a Shorthorn breeder in the year 1853, and made a very good start by repairing to Springfield Hall, near Lancaster, and buying, from Mr. S. E. Bolden, the Booth and Bates bull May Duke (13320). This animal was by First Grand Duke, and was out of a Warlabby heifer, Vivacity, by Fitz-Leonard. He made a large fine animal; and after being used for a few months at Stackhouse, upon many cows of good but mixed and miscellaneous breeding, he went to the Hon. Mr. Hill's of Berrington, for 150 guineas. There he did abundant service, and from thence moved to Mr. Robinson of Clifton Pastures, at which place, where he still remains, he has established a very high reputation, especially as a getter of heifers, and as a remarkably sure sire. Mr. Carr tried successively the Waterloo blood, the blood of Lord Spencer, the Victoria blood (having owned Victoria 8th, who, with her calf Great Mogul in her, he sold to Mr. Marjoribanks for a comparatively small sum of money, within a week of calving), and purchased largely at various sales animals of pure and safe pedigree without much reference to any particular family or tribe. This plan, however, he quickly abandoned. Having paid a visit to Warlabby, his eyes were at once opened to the extraordinary characteristics of that noble herd, and he forthwith resolved to gather together a set of Shorthorns, with as much as possible in them of the Booth blood, and to hire regularly from year to year a Warlabby bull. This determination involved great expense and considerable

anxiety; but Mr. Carr has already begun to reap, in pecuniary benefit, the fruit of his decision, and has the satisfaction of seeing himself surrounded by an admirable herd of well-bred animals.

The Warlabby bulls hitherto used upon the Stackhouse herd, are Prince of Warlabby, Majestic, Lord of the Valley, Valasco, Prince Oscar, Windsor, Monk, and Elfin King. Windsor, whose reputation for prolificness has been extensively impugned, got, whilst with Mr. Carr, upwards of twenty calves. I can speak on this point with the most distinct positiveness, and am glad to have an opportunity of doing so, inasmuch as certain hostile and malignant persons have dared to say that the animals attributed to that distinguished bull were really the offspring of some other. Mr. Carr had no bull on his premises, during Windsor's term of service, but Windsor; and, indeed, if he had had fifty other bulls, he is utterly incapable of being guilty of recording a wrong paternity. Apart from this, the Windsor calves, all the world over, bear unmistakably the stamp and character of their sire.

Mr. Carr's herd at present consists of about twenty-two females, and five bulls. The bulls are all "pure Booth;" and of the cows and heifers no fewer than twelve or thirteen are so, whilst six of the others are entirely of the same strain but for half a cross of different blood in some cases, and a whole cross in others. Practically, these 18 females are pure Booth.

He who expects from favourite blood a set of animals invariably exhibiting the perfection of the highest properties of their kind, will be disappointed. A cow may be a very good cow and a very valuable cow, which has some faults fatal to what is understood by the term "beauty;" for the object of high breeding in cattle is not, I apprehend, to secure *beauty*, which is only one desideratum among others, though a delightful one, but to produce stock that will ensure, with less general cost than inferior animals, a larger amount of advantage. Mr. Carr believes that cows of the Booth sort, notwithstanding certain points which may be objected to by not uncandid judges, and notwithstanding every now and then the appearance of a

"mis-fit" (a calamity from which no tribe of Shorthorns is exempt), are to be depended upon more than any other breed for steadily yielding the materials out of which a grower of horned cattle is to make his payment and his profits. A man who professedly breeds for the show-yard is a man who will find himself mistaken, and sooner perhaps than he supposed; but a man who perseveringly and hopefully adopts the healthy practice of buying nothing that is not really well bred, and using no bulls that are not of the purest blood, *with reference only to the possession of good beasts*, may find himself, to the dismay of more ambitious competitors, in a position to enter the lists, if not always with the certain prospect of success, invariably with honour and an increased reputation as a breeder.

The oldest cow in the herd is Farewell, red and white, calved in 1851, and bred by the late Mr. John Booth of Killerby. She is a cow of no great *apparent* pretensions, but is well bred, being by Royal Buck (10750), and possessing a pedigree that goes as far back as Favourite; she is the dam of Mr. Carr's best young bull, and, without exhibiting any striking excellences, possesses many properties of great importance. Her appearance is feminine; she has a substantial and truly built frame, with a brisket moulded in a peculiarly sweet fashion, and presents to the touch a hide which could scarcely be objected to by the most fastidious judge of "handling." She is, besides, a deep milker.

Farewell is grandam of Mr. Ambler's prize-bull, Prince Talleyrand, which was bred at Stackhouse, his dam being La Vallière, sold by Mr. Carr to Captain Spencer of Distington, for 140 guineas. Farewell is also the dam of Viscount Killerby (by Lord of the Valley), sold by Mr. Carr at the age of six weeks to Mr. Hower of Sevenhampton, for the sum of 100 guineas. Imperial Windsor, another of her sons, will be noticed by-and-by.

Before I enter upon a description of Wide Awake and her progeny, it may be interesting to your readers if I record some particulars of Bonnet, her dam, a cow well known in the sister island. Bonnet was bred by Mr. Richard Booth, and was presented as a gift to his brother, the late Mr. John Booth of Killerby. She was sold at Mr. John Booth's sale in 1852 to Mr. Anderson, from whom in 1854 she passed into the hands of Mr. Wood of Castle Grove, county Donegal, whose property she still remains. Bonnet was calved in 1844, and will consequently be seventeen years old in the April of 1861. Since Mr. Wood has had her, she has produced every year a living calf, and is again some months gone in calf. But unfortunately only two of those calves are at present alive, and in his possession—Bustle, calved in 1855, by Valiant (10989), and Prince Patrick, calved in 1858, and by Mr. Booth's Prince Arthur. Bustle, though only five years old, has produced four heifer-calves, and is again in calf. Her eldest daughter, Princess Royal, by Prince Arthur, died when two years old, shortly before the time at which she would have calved. The other three are alive: the eldest of them, Princess Maude, also by Prince Arthur, only two years and a few months old, has produced this year a fine heifer-calf by Mr. John Booth's King Arthur, and is again safe in calf.

Bonnet is a thick, short-legged cow; heart and floor of the chest particularly good; a sweet head; especially fine well-placed shoulder; good neck vein; splendid fore-flank and fore-rib; level below, and preserving her shape wonderfully. It need scarcely be said that she is a cow of excellent constitution. Bustle possesses great substance, splendid shoulders, flanks, ribs, quarters, and twist.

Mr. Wood, on more than one occasion, could have had 500 guineas for her, and an equal sum for her daughter Princess Royal. The whole tribe is remarkable for substance, constitution, and milking qualities. Mr. Wood has for some years been using Crown Prince bulls out of Buckingham cows, or cows with a good deal of Buckingham blood; so that the descendants of Bonnet are full of Crown Prince and Buckingham blood.

The writer of this paper had the offer of Wide Awake, a daughter of Bonnet, for 60 guineas. She was then a plain, small, mean-looking cow of five years of age; and as there seemed to be nothing *except her pedigree* which could possibly make her a good purchase at that price, she was declined; and Mr. Carr, relying entirely on the blood, immediately secured her. He was right. On the rich land to the east of the river Ribble she very soon began to put forth the qualities and characteristics of her race; and before twelve months had passed away, Wide Awake assumed in the eyes of all competent visitors the undoubted aspect of a pure Booth cow. Wide, deep, round-ribbed, well-haired, thick-fleshed in every part, but especially so in the best parts, she at once attracts the notice of beholders, and obtains their commendations. Mr. Carr was unfortunate in losing the first two calves she produced after her arrival at Stackhouse—Lady Lucinda, by a bull of Mr. Robert Emmerson's, *Exquisite* (14524), to whom she was in calf when Mr. Carr bought her; and Princess Warlaby, by Prince of Warlaby. This calf, a beautiful roan, only lived to be nine weeks old; but Mr. Carr had already refused an offer of 150 guineas for her, from the agent of a well-known and successful breeder. Wide Awake has, however, produced two heifer-calves since then—Lady of the Valley by Lord of the Valley, and Windsor's Queen by Windsor. Besides these, Mr. Carr possesses a Windsor heifer-calf, Lady Windsor, out of Lady Grandison, a daughter of Wide Awake, by Gainford 5th (12913). Lady Grandison was recently disposed of to Lady Pigot. Here, then, is the nucleus of a splendid herd—Wide Awake, Lady of the Valley, Windsor's Queen, and Lady Windsor; and if these animals do not belie their antecedents, Mr. Carr may reasonably expect within the next few years a goodly number of pure Booth females of the famous Bonnet tribe, a family remarkable for its early and long-continued fecundity.

Lady of the Valley, not quite two years old, and in calf to Valasco, is a heifer of more than ordinary promise. More level and even than her dam, she exhibits her dam's tendency to width and substance, but is superior to Wide Awake in symmetry and general style, and has the advantage of a rich deep colour very much resembling that of her sire. Lady of the Valley spreads out a wonderful back, and has the thick strong loin of her grandsire, Crown Prince. A person familiar with the Warlaby herd can hardly fail to be reminded, when beholding this fair heifer, of Red Rose, her paternal grandam. Her brisket drops down and is shaped according to the pattern of the brisket of that most lovely cow.

But Windsor's Queen, the other daughter of Wide Awake, by Windsor, is a better calf than ever Lady of the Valley was, and may possibly make a better cow. She was calved on the 1st of August; is a beautiful cool roan, has crops as wide as her loins, a quantity of long fine hair, a neater and sweeter head than either her dam or sister, and stands wide apart on the fore-legs. Her hind-quarters, like the hind-quarters of all Windsor's calves, are long and level; the flank lineable with the belly, wide and heavy; and the side, just below

the spring of the ribs, straight as a straight stick; the body presenting in profile a perfect parallelogram. Mr. Carr refused for this calf, when not more than a month old, two-hundred-and-fifty guineas: for Lady of the Valley he declined an offer of four hundred guineas at the same time; and for Wide Awake, since the birth of Windsor's Queen, a similar sum of money; no less than 1,050 guineas for three animals. These were *bona fide* offers "without reserve."

I have mentioned with some particularity three of the Bonnet tribe. There is one other, Lady Windsor, a white heifer calved in April. Lady Windsor, by Windsor, is, as I stated before, out of Lady Grandison, a daughter of Wide Awake by Gainford 5th, and now the property of Lady Pigot, who bought her in September for 250 guineas. Lady Grandison is a very excellent cow, and a very true breeder. Mr. Wood of Castle Grove gave Mr. Carr eighty guineas for her first calf, Lady Buckingham, by Duke of Buckingham (14428); but was so unfortunate as to lose it when only four months old, having taken it from Stackhouse at the age of ten weeks. Lady Windsor is as good a calf as need be desired. Her crops are very surprisingly developed; her shoulders beautifully laid back; her hind-quarters long and level, and well packed with flesh; twist "wealthy;" hair fine as well as abundant; and her brisket projecting forward so as to bring the point actually even with the bend of the throat, from which the neck and region of the bosom descend in almost a perpendicular line. She is a superb heifer.

Rose of Windsor, a calf about the same age as Lady Windsor, and by the same renowned sire, occupies a loose box near her half-sister, and invariably attracts the immediate attention of the visitor to the Stackhouse herd. Her colour justifies this, even if she had no merit beyond; for it is the richest possible roan, very much like that of Windsor's dam, the Royal prize cow Plum Blossom. But she has merit beyond, and merit somewhat equal to the beauty of her well-haired and blooming coat. At present she not only doesn't show a single faulty point, but looks as if she would go on without exhibiting one. As she will probably be "brought out" at the Leeds Royal, your readers may have an opportunity of forming a judgment for themselves. She is out of a Baron Warlabry heifer, Mistress Mary, bought by Mr. Carr, at an early age, from the late Mr. John Booth of Killerby, and combines the famous blood of Windsor, Baron Warlabry, Royal Buck, Hopewell, and Hamlet. If your readers will take the trouble just to go carefully through the pedigrees of these bulls in the Herd Book, they will rise from the investigation perfectly astonished at the superb combination of distinguished families in this young heifer. Lady Pigot now possesses Mistress Mary, having given Mr. Carr 170 guineas for her a few months ago; and if she breeds at Branches Park as well as she has done at Stackhouse, her present owner will have reason to call her bargain a very good one. I know that Mr. Carr received for Rose of Windsor, when only ten weeks old, a cheque for £210, and returned the tempting bait by the next post.

Bridesmaid (red), Rosey (dark roan), and Familiar (white), are by Master Belleville, a son of the Royal prize bull Belleville, out of a pure Booth dam, and are descended from Mr. Maynard's excellent cow Rosamond by Jack Tar (1133). They may be said to be, with the slight exception of Master Belleville, pure Booth animals. Bridesmaid is as handsome a cow as a man need wish to have on his premises, and possesses every desirable quality of a high-bred shorthorn. Very short in the leg, very thick bodied,

very full of flesh and hair, very flexible in the hide, with a glorious outspread back as broad in one part as in another; a lovely knowing little head, and a pair of genuine horns about which there can be no mistake; and inheriting, besides all these visible properties, the inestimable virtue of fine old blood, it is no great wonder that Bridesmaid should have been the dam of Mr. Ambler's prize heifer Bridal Flower, which that gentleman bought when a calf at Stackhouse, and sold afterwards for a large sum of money to go into Australia. Mr. Carr has, unfortunately, lost two heifer calves out of Bridesmaid—one by Majestic, the other by Lord of the Valley.

Rosey is a lovely cow, but not in my opinion equal to Bridesmaid. She is the dam of Windsor Lily, calved in February, 1860, which will make, unless all present promises and appearances are falsified, a cow of first-rate stamp.

Familiar, the last of the three I have classed together, is a large roomy cow with good general shapes, a fine head, unexceptionable horns, well formed and massive bosom, a magnificent udder, and plenty of flesh for a hard-milking animal. Cows of this stamp are not to be met with every day, though Mr. Carr has been particularly fortunate in securing a herd which yields far more than an average quantity of milk.

The next in chronological order is Barmaid, a heifer which Mr. Carr bought at the Luton sale for 100 gs., and which turned out immediately afterwards not to be in calf. She is now breeding to Valasco (15443). Though inclined to be a heavy fleshed animal, and exhibiting most unquestionably some valuable properties, Barmaid is an unpleasant looking personage, and presents to the visitor an ungainly head. I think I may say, without any deduction from truth, that having seen and admitted her several excellences, the critic has nothing to do but to "look in her face, and he'll forget them all." Baroness, the dam of Barmaid, was a fine old cow, by Baron Warlabry; and the offspring of Barmaid, being by Valasco, just the bull to suit her, may inherit the virtues of its noble grandam. Barmaid is exceedingly well bred, and shows good breeding in many points.

Lady Killerby, whose bull-calf, Lord of Windsor, was sold to Mr. Wright of Hull, the author of the prize essay on Cattle Feeding, has only one fault, unless the tawny red of the old shorthorns of seventy years ago be considered a fault also. She is rather too small for a three-year-old heifer; and having said this I have nothing more to advance against her. She was brought from Killerby when a calf, was particularly neat and compact when Mr. Carr bought her, and has maintained every promising quality of her early youth. A sweet head, with a gentle feminine expression of eye; horns drooping gracefully towards the face; a wide well-fleshed back; shoulders exquisitely framed and symmetrically laid; loins firm, thick, and ample; quarters square, fleshy, long, and even; hide flexible and mellow, with a flank just what a flank should be, deep, heavy, horizontal, and broad—extending, I mean, well toward the udder; fore-legs standing more apart than I remember ever to have observed in a cow of her size; and beyond them, projecting well but not unduly, and filling all the space between, a bosom beautifully moulded, sweeping upwards into a round full neck vein, and hiding the shoulder point entirely as it fades away. These are the most evident characteristics of this lovely heifer; and when to these characteristics it is added that she exhibits in her pedigree, and in the following order, the bulls British Boy, Hopewell, Hamlet, and Leonard, thus com-

lining some of the best of the Booth families (such as the Strawberry and Hahnaby—the Faith, Hope, and Charity—and the Bracelet tribes), enough has been said to assure your readers that Mr. Carr possessed himself of a valuable animal for breeding purposes when he purchased Lady Killerby.

Everilda, a white two-year-old by Baron Warlabby, with three crosses beyond—Highflyer, Hamlet, and Roland—is an exceedingly stylish heifer, and fully confirms the promising appearance she presented when a yearling. She bears a striking resemblance to her sire; and, like her sire, is less excellent in her flank than might be desired.

Calendula, a two-year-old by Majestic (18279), Hamlet, Leonard, Buckingham, &c., &c., is a good roan heifer, square, short in the leg, bulky, and well haired. She has recently dropped a white heifer calf with roan ears—Maid of Windsor—to Windsor. Calendula is out of Calomel, bought by Mr. Carr, together with a bull calf at her side, for 150 guineas, of the late Mr. Booth of Killerby. Calomel has been an admirable breeder. Mr. Carr sold an uncommonly fine bull-calf out of her, four months old—her last calf—for 80 guineas, a few months ago. He was by Windsor.

Bella Donna, twin with Prima Donna (sold under a year old for 170 guineas, and exported to Australia), is a good young animal. Her dam, Violet, is a very superior cow indeed, and was sold a short time since to Lady Pigot for 200 guineas; and if Bella Donna should turn out as good a beast as her mother, she will do. What she wants most is, general style; but she is a thorough Shorthorn, and a Shorthorn of a prizeable sort—thick, compact, fleshy; a good thriver and a good weigher. She has bred a capital roan bull-calf, Don Windsor, to Windsor. Indeed, this calf *should* be a good one, showing as it does in its pedigree Windsor, Majestic, Lord George, Vanguard, Hamlet, Sir Roger, and Studley Royal. He will prove himself peculiarly useful in a herd which wants flesh and substance.

I close my notices of the females in the Stackhouse herd with that of Annabel, a three-year-old white heifer by King Arthur, out of Queen Charlotte, once as lovely a Shorthorn as ever walked, now a grand old cow, and the property of the Rev. Mr. Storer of Heliidon. Queen Charlotte is full of Bracelet blood. Her sire, grandsire, and great-grandsire, were all sons of that celebrated animal; and the result of a careful analysis of her pedigree shows that in point of fact she has in her, *minus* one-sixteenth, as much of Bracelet's blood as if she was Bracelet's own daughter. Annabel is by King Arthur, a son of Venus Victrix by Vanguard, and she wears an unmistakable Vanguard head. Though not strictly a *handsome* heifer, she is a very valuable one, as well by reason of her personal properties as on account of her illustrious blood. Her frame is large and finely moulded, and she carries a heavy weight of good flesh. Her shoulders, at one time not particularly attractive, are now more than ordinarily sweet; and in this respect she affords both a warning and an encouragement to breeders of Shorthorn stock, who are sometimes apt to draw conclusions unfavourable to an animal, in consequence of inaccurate appearances which a few months may correct. Annabel is in calf to Elfin King.

Mr. Carr has five young bulls, all of them by Windsor, and none of them unworthy of their sire. The best, in my opinion, is Imperial Windsor, out of Farewell by Royal Buck. This young animal, calved early in April, offers to make a large beast, but is neatly formed and most compactly put together. His hair is long, thickly

massed, fine in the quality of its touch, and of the grandest roan imaginable. His crops are very wide and fully developed, reaching well down and backward. His girth is ample, both immediately behind the arm and across the loins, which are actually lineable with his hips; and his flank, parallel with the profile of his back, hangs down a weighty substance extending nearly half way under his belly. Imperial Windsor, whom Mr. Carr has more than once declined to part with, is destined, I doubt not, to be the sire of first-rate animals. His mother is just the sort of cow to breed a bull from—not too large, and particularly feminine.

But some persons have preferred Royal Windsor, a splendidly bred white bull, calved in January, and out of Queen Charlotte, the dam of Annabel. And indeed Royal Windsor is a noble bull. His hair, not quite so abundant as that of Imperial Windsor, is sufficiently plentiful, very fine in texture, and of a rich yellow hue. He is remarkable for a much more arched and thickly developed crest than bulls inheriting chiefly Warlabby blood are in general found to possess; and has a pair of eyes which, though unusually prominent, are happily without the unmeaning stare which prominent bulls' eyes too often exhibit. The countenance of Royal Windsor is truly masculine, combining, as masculine expression most assuredly should combine, whether in man or beast, gentleness with majesty.

Fitz-Windsor, white, by Windsor, out of Lady Hessel-tine, a daughter of old Calomel, is also a very good bull, very well haired, with a profile remarkably like that of his sire. Fitz-Windsor will be a valuable bull for a herd that wants size and hair. He has a weighty flank.

The only bull that remains to be noticed is Young Windsor, a rich roan, by Windsor, out of a Royal Buck dam. He inherits the blood of Windsor, Royal Buck, Leonard, Roland, and Priam (sire of the celebrated twin cows, Necklace and Bracelet), and has highly meritorious points. His mother, whom Mr. Carr parted with some time since, was a neat cow, possessing great milking powers.

The reader may have observed, that in speaking of the Stackhouse Herd I have abstained from using, in its popular signification, a word which occurs with frequent repetition in most notices of Shorthorn stocks. I mean the word *quality*. And I have refrained from this word, not because I don't know the meaning assigned to it by the generality of those who adopt it, nor because it would not be applicable in its popular sense (for it *would*) to Mr. Carr's herd, but because I think the almost exclusive restriction of the term to the *exterior* portions of an animal involves a palpable grammatical injustice, and implies an undue preference of one excellency over a great number of others. Quality is a noun of general signification, and is equally applicable to an indefinite variety of most opposite particulars. It is, I think therefore, not wise to confine it to one object, and to that one object entirely in connection with the sense of touch.

But, for the occasion, and regarding the word in its popularly accepted meaning, it might be at least interesting to inquire into some of the stereotyped credenda of the day, with a view to ascertain whether or not they owe their establishment to the truth on which they rest. I hear "quality" spoken of as a pleasing and infallible criterion of propensity to fatten and to lay on the best of flesh quickly; and I am told that whatever Booth animals may be in other respects, they are not worthy to be compared with animals of the Bates sort in respect of *quality*. If this

proposition means anything, it means of course that Bates animals are disposed to ripen more rapidly than animals of the Booth tribes. I should have no hesitation in disputing the proposition. Let two animals, one of each class of blood, and both of the same age, be brought together: let them be treated exactly in the same way; fed at the same times, and with the same sort of food; let the circumstances of their existence be in every respect similar; and, granting that the "quality" of the Bates animal was superior to that of her companion—which of the two (I appeal to experienced observers for an answer) would come out, at the end let us say of two years, the largest, the fattest, the heaviest; and which would be worth the most money to the butcher?

I am, Sir, respectfully yours,

R. F. HOUSMAN.

P.S.—Since this letter was written (in November last), the Stackhouse Herd has undergone some changes. Rosey has been sold to Lady Pigot, and Familiar 2nd to Mr. Storer. Both have produced heifer calves to Valasco; that of Familiar (a white one named Oriana) being retained at Stackhouse. Barmaid has yielded a very good white heifer, Mrs. Quickly, to the same bull; Farewell (for whom Mr. Carr refused an offer of 150 guineas *since* she calved) twin roan heifers of

great promise, Christabel and Claribel; whilst Lady of the Valley has presented her owner with a rich roan bull, Prince of the Blood. But the most important changes which have taken place in Mr. Carr's herd are made by the addition of Bonnet, Princess Helena, and Princess Louise, all of them recently obtained from Mr. Wood of Castle Grove at large prices. For Bonnet, now nearly seventeen years old, a sum of £80 was paid, double the price she fetched at the Killerby sale in 1852. Princess Helena, two years old, was secured at a cost of £375; and Princess Louise, calved last June, £250. These heifers are out of Bustle, Bonnet's daughter; Princess Helena being by Prince Arthur, and Princess Louise by King Arthur, the son of Venus Victrix. Princess Helena is a well-grown and most admirable animal, bearing a curiously close resemblance to her cousin Lady of the Valley; and her sister Princess Louise, a rich roan, gives promise of mature excellences. Mr. Carr now possesses eight animals of the Bonnet family—Bonnet, Wide-awake, Lady of the Valley, Windsor's Queen, Princess Helena, Princess Louise, Lady Windsor, and Prince of the Blood. Mr. Wood has only one of the Bonnet tribe left—Bustle; but he still retains his famous Norma family, of which the only two sold (one to Captain Spencer, and the other to Mr. Douglas) have been greatly distinguished.

Lune Bank, Lancaster, March 20, 1861.

OUR OLD AUTHORS ON SHEEP-ROT.

According to the old proverb, "Every tub must stand upon its own bottom." In no department is this more true than in farming. Fallen humanity may be fond of the marvellous, but witchcraft has long since been excluded from every branch of husbandry. A liver fluke, although it has been considered amongst the nearest approaches to "spontaneous generation," has, nevertheless, its own natural history. Man, and the various animals of the lower creation, to whose hepatic organs Nature has assigned it (the fluke) a rightful habitation, have each their own natural history, so that in this respect there is a common footing of equality between them.

It may be humbling for some proud hearts to think that flukes should swarm in their gall-bladders; but there they are, under certain pathological circumstances, in ugly numbers, to speak for themselves and the natural family to which they belong.

It is not by eating whit-worts, penny-worts, sarsille, bugle, butter-worts, sun-dews, and louse-worts, or grass in low marshy meadows "of a morning before the dew is off," that is the cause of fluke in the liver of man; nor is it any of the other causes assigned for rot by the various writers quoted in a previous article. Moreover, this conclusion is equally obvious in the cases of such of the lower animals infested with fluke, but which are not subject to the causes said to produce this entozoon in sheep, while the sheep itself often experiences rot and fluke when housed similar to rabbits, pigs, and poultry. More does not require to be said to justify the dismissal of all the causes quoted, as being unsatisfactory, and that the presence of fluke in the livers of sheep is to be accounted for by a natural law peculiar to itself and the family of animals to which it belongs. It would not be more absurd to say that sheep were produced in Wales by the clouds that hang on Snowdon's top, than it is to say that flukes are pro-

duced in sheep's livers by eating grass "of a morning before the dew is off."

But, although the causes assigned are not the primary ones, they may, nevertheless, be the proximate causes of that stage of the disease known amongst practical farmers as "the rot." If we can show satisfactory data for this—and we aver the facts of the case furnish ample materials for doing so—then we shall be able to reconcile the conclusions of the agricultural writers, shepherds, and others quoted, with the laws of Nature to which fluke and the animals it infests are both subject. We will at the same time clear away a vast amount of rubbish that now lies in the way of this important branch of husbandry, sheep management being based upon a scientific and solid foundation; for if the sheep is subject to one code of Nature's laws, and the liver-fluke to another code of Nature's laws, and if the two codes are opposed, the one to the other, then the practical conclusion is manifest that we must take steps consistent with Nature's laws to prevent the latter code, the one favourable to the formation and development of fluke, from coming into operation. In other words, we have to study closely the natural history of the sheep, and to remove all obstacles that stand in the way of that code of Nature's laws to which it is subject having free operation. It is not enough that we prevent the formation of fluke in the liver, for we must at the same time promote the highest development and state of well-being of the sheep. In point of fact, the latter is the shepherd's proposition, for it is sheep that farmers should breed, and sheep only. With the breeding of liver-fluke they ought to have nothing to do.

That disease in sheep which has from time immemorial been known to farmers, and designated by them as "rot," is not the first stage of a disease, nor the second, but that stage when it assumes a certain form—*viz.*, rottenness. (We purposely

avoid scientific and technical expressions in medical science.) It is almost always accompanied by fluke in the liver. But flukes exist in the liver before the disease assumes this rotten form, and very often after the sheep has been cured of rot. When flukes first begin to make their appearance in the liver, sheep actually fatten faster than those free from fluke: so it is said by all the authors quoted. With this stage of the disease, Dr. Harrison says, "practical farmers are familiar, and take advantage of it." Again, when sheep that have had the rot, but have been cured of it and fattened, are slaughtered, flukes are found in the liver; thus proving another stage of the disease, for so long as fluke exists disease must also exist. We have thus three stages of a disease where fluke exists in the hepatic organ: the first, immediately prior to rot; the second, during the stage of rot; and the third, after rot has for a time disappeared, so as to permit of the sheep being fattened and slaughtered. These three stages of the disease are well known to practical men. They are noticed by all the writers whose works we have quoted, and by modern writers on the subject generally speaking.

Having thus shown three stages of a disease in which fluke exists in the liver, the inquiry naturally arises, how many more stages are there? and at what period or stage does the fluke first make its appearance? The presence of this entozoon in the hepatic organ is manifestly not the first stage of the disease; for, besides being absurd from a scientific point of view, such a conclusion is diametrically opposed to that code of Nature's laws to which the sheep is subject. It would be presumption to impeach Nature with such an anomaly as this involves. The presence of fluke in the liver of a sheep is an infringement of that code of laws upon whose free operation the wellbeing of the flock depends. Flukes should not be there. It does not require logic to prove this. Our shepherd's proposition is to breed sheep, not entozoa. Dr. Thomson, referring to entozoa generally in man, says, "Debility, from whatever cause arising, is undoubtedly the condition which chiefly favours the generation of these parasites;" and the conclusion is also applicable to our cattle. A stage of the disease in question exists prior to the presence of the fluke, and that stage is debility. The hepatic organ is from some cause or other in a debilitated state; it ceases to perform its functions in accordance with the laws of health to the sheep, but in harmony with those favourable to the formation and development of fluke, which seldom fails, sooner or later, to make its appearance in the liver; thus adding another co-operating cause of disease to that which previously existed.

We have now got our subject into a different phase for examination. Hitherto we have had flukes in the liver; but we are now at a stage prior to their existence, viz., *debility*. What is debility? Such is now our problem for solution. Does it arise from the presence of impurities in the blood, owing to the injection of poisonous matter in the food? or owing to the imperfect oxydation of the vital fluid? or owing to the imperfect discharge of waste matter by the excretory functions? or owing to the presence of morbid matter from some other source? or does it arise from a deficiency of certain properties in the blood, owing to imperfect food? In other words, does debility arise from the hepatic organ not receiving its natural stimulus? Is a deficiency of bitter aromatic principle in the food of sheep, or an inferior quality of bitter aromatic principle, favourable to debility of the hepatic organ and ultimately to the presence of fluke? And is a deficiency of common salt favourable to debility in any of the other functions of secretion, and to the presence of certain of the other entozoa that infest the alimentary canal? These and many other questions of a kindred character call for a

practical solution the moment we enter upon the practical investigation of this part of our subject. It is therefore manifest that debility may arise from various causes. When we reflect that the sheep is naturally the inhabitant of alpine districts, we at once perceive that to confine it in low, marshy grounds by artificial means is of itself an infringement of Nature's laws capable of producing debility. The fact that mankind suffer from liver complaints and debility in all such cases, warrants this conclusion in reference to the sheep, as noticed by several of the old authors quoted. And as the consumption of an extra quantity of aromatic bitter principle in the food of those of the former who inhabit low grounds is found the only safe course to prevent such complaints by preserving this organ in a healthy state, the practice is suggestive of the course to be pursued in the case of the latter, as shown in a previous article.

Now, when we take into consideration the natural history of the sheep, more especially as regards its peculiar physiology and hygienic economy, the quality of food and general treatment it ought to receive on the one hand, and when we compare such with the food and treatment it actually does receive on the other—the disease in its different stages—the *vis medicatrix nature* put forth to keep down the progress of disease, it will be seen that the facts of the case formerly alluded to, as to the causes of rot, &c., may be satisfactorily disposed of, some one way and some another. Our space will not permit of going into any lengthened detail; but this will be found unnecessary, as our quotations chiefly refer to one stage of the disease, viz., when it assumes the character of "rot."

The causes quoted may be disposed of under the following heads: 1st, The eating of noxious herbs; 2nd, Food containing an excess of moisture and other principles that derange the digestive functions; 3rd, An unhealthy atmosphere, and causes affecting the respiratory functions; and 4th, The reason why sheep fatten faster when first infected with the rot.

With regard to whit-rot, butter-wort, sun-dew, and louse-wort, sheep in a healthy state do not eat such plants; but in a diseased state, as when suffering from the presence of fluke in the liver, or even debility from a deficiency of bitter aromatic principles in its food, a sheep when turned into fresh ground will search for, and eat almost any thing that is acrid, pungent, and bitter, to cure itself of fluke, functional derangement, &c. The medicinal properties of these plants are well known; but, instead of being favourable to the formation and development of fluke, they are the very reverse, for, if eaten in any quantity, they would prove injurious to the health of both fluke and sheep. If eaten in lesser quantity, the effect produced is likely to be confined to derangement of the digestive functions of the sheep, to an increase of debility, and, finally, to rot. There is nothing, therefore, impossible in this conclusion of old authors and farmers, but the contrary.

Under the second head there is nothing more calculated to derange the digestive functions of sheep, than washy mucilaginous food, especially if deficient of tonic and astringent principles. Professor Fritze, in his "Medical Annals," states that "Vegetable mucilage, when used as a principal article of diet, relaxes the organs of digestion, and produces a viscid slimy mucus, and a morbid condition of the *prima via*." So, that, as Lawrence observes, turnips, oil-cake, and the like, make bad food for sheep. The result in this case would thus be similar to what it is in the last—derangement of the digestive functions, an increase of debility, and, finally, rot.

Under the next head, low marshy grounds, even in a dry season, would affect the respiratory functions of the sheep, as already shown; so that in a wet season, like the past, an increase of debility would arise from impurity of the blood, the result being thus similar to the others.

And, lastly, with regard to sheep getting fat on this disease, the anomaly is easily disposed of—for fatness at the best is an approximation of disease; and, in this case, the increase of weight arises chiefly from an increase of water, and inferior fatty matter in the system, or, as it is termed by the different authors quoted, a sort of dropsy. We have no relish for mutton of this quality, much less do we wish to countenance its production, commerce, and consumption—the fat, lean, and juices being all bad. When sheep assume this drowsy state, it is obviously a very bad symptom of the disease.

In practice, a combination, in some way or other, of what we have thus disposed of under four separate heads, is probably that which is generally experienced. Such combinations will, no doubt, present a very wide diversity when individually considered, so that no two of them may be alike in every respect. In point of fact, this is absolutely necessary, to reconcile the wide diversity of predisposing causes (if we may be allowed the expression) with the uniformity of the result produced.

With regard to the *per-contra* side of the question, the various plans pursued to prevent disease are as easily reconciled with the salutary effect produced by them, as we have seen is the case on the other side. When the balance is in a state of equilibrium it requires little to turn it the one way or the other. Just so it is when the *vis medicatrix nature* of the sheep is in a state of equilibrium with that debilitated state of the system which constitutes the first stage of the disease. Under such a condition a dry bed at night, a little dry food, “3lbs. of salt to forty sheep,” or simply to allow the dew to be “evaporated from the grass of a morning,” thrown into one

scale, may turn the trembling beam in favour of the sheep, just as a few dewdrops in the opposite scale produces the contrary effect. But when once fluke begins to infest the liver the gradual ruin of that organ is manifest, while the action of unhealthy bile upon the alimentary functions, daily increasing from bad to worse, cannot fail to terminate in what may be justly termed a rotten state of the whole system.

Again, the fact of the various preventive-nostrums, as salt, decoctions of bitter plants, and such like, not having met with the approbation of practical farmers, is just as easily reconciled with science and the natural requirement of the sheep. It does not require logic to prove this, for such preventive nostrums are wholly incompatible with the hygienic economy of this little mountain quadruped. Salt may prevent fluke, but this is not enough, for it is not by the mere prevention of this entozoon that farmers live and pay their rents. It was not upon salt that the writer's sheep bred and got fat in his salt marshes, but upon the herbage, whose health and chemical properties were affected by the salt as well as those of the sheep. On the contrary, the less the quantity of salt the better. Sheep require a certain amount of salt daily; but an excess, to prevent worms, is hurtful; and if bitter aromatic principle is wanting in the food of sheep, an extra quantity of salt must be used to prevent worms, and then the practice will not pay the farmer. Again, decoctions of bitter plants are not the practical plan to exhibit bitter aromatic principles to this animal. It is at variance with its natural habits; and besides this, it won't pay. The farmer's proposition is not to prevent the growth of fluke and other entozoon, but to supply his sheep with food of the quality its natural wants require; and for these the preventive nostrums do not make satisfactory provision. Hence their rejection by practical farmers of the old school, as well as by those of the present day, as unsatisfactory, and only used by them in the absence of better.

W. B.

THE BULL “WINDSOR.”

[The following letter has been addressed to Mr. Carr, of Stackhouse, who has forwarded it to us for publication, as bearing upon the description of his herd:]

Braithwaite, April 4th.

DEAR SIR,—As reflections or doubts as to the capabilities of Windsor being a sire are expressed by parties referred to in the notice of the Stackhouse herd, I give you the result of his visit to Braithwaite, which is due to Mr. Booth and all shorthorn breeders that have used bulls by Windsor. The bull Windsor arrived 22nd of May, 1860, and remained until first week in February, 1861. He came not on hire or to replace any other bull, but as a kind and generous loan. In all I had 24 cows and heifers, most of them ready for him. The following list is the amount of my success with him: Two cast their calves in December and January. Vesper calved the 8th of March a roan c.c.; Sweet Carnation, 1st of April roan c.c., twins. I expect one on the 9th of this month, ditto on the 15th of May, the 22nd of June, 6th, 12th, and 27th of July, 5th and 29th of August, and one almost certain in September—if not to Windsor to no other; she has not been in season since the end of January, just before Windsor left for Killerby: a fair lot for an old bull labouring under an impediment,

which, after the Warlaby herdsman's instructions, was easily got over. No other bull was used from 22nd of May until the end of November but for two animals, which proved barren, and Windsor became ill with dysentery. Prince George was then used to the cows that had missed to Windsor. The latter bull then went to Killerby, and I saw him a few days since, and hope another Soldier's Bride may yet be produced to the owner of the Warlaby herd, who has so generously helped so many tenant-farmers to good stock by such acts of real kindness as were conferred on myself by a visit previously, for five weeks, of Sir Samuel, before Windsor's arrival; the result a beautiful white heifer calf, and a dark-red and white, both living, and a b. c. cast.

If my testimony is of any avail in removing the erroneous impressions that Windsor is no sire, pray use it. That at times there is more certainty than at others of his being fruitful is true, but with patience and perseverance calves are obtained. Windsor was out at grass, and no artificial food until November was given to him.

I remain, yours truly,

RAYMOND BRÜERE.

THE FLOCK IN THE SPRING.

The lambing season being now for the most part over, the first thing I shall offer a remark or two upon is the subsequent management of the breeding flock. Now, this is a more important question than breeders in general are disposed to admit. The breeding flock is always the first to be made to "make any shift" if a difficulty arises in the amount and quality of the keeping. "Oh, the old ewes must take their chance"; yes, a chance that very frequently produces deplorable results in the following winter. Depend upon it, if the lamb is not thoroughly reared in the summer, it cannot thrive through a precarious and severe winter; and if it fortunately should succeed in getting through its cold and storms, its constitution is frequently so impaired that it is unfit for profitable grazing or subsequent breeding.

My last paper on sheep was in reference to the lambing season exclusively. I now offer a few observations in continuation of their proper management, and of the flock generally. The ewes will still require for a considerable time their ration of cake, oats, or cut chaff, together with a moderate allowance of mangolds, daily. This allowance to be gradually decreased as the pastures progress, but not to be wholly withheld, till the grass is plentiful and nutritive. It is highly desirable to continue the allowance of cut chaff or oats, or, if more convenient, by all means cake; for bear in mind that a great thing to be aimed at, in sheep management, is the earliest possible maturity, and this can only be attained by good and liberal keeping. Never let them deteriorate in condition, and nothing conduces more to promote the healthy growth of the lamb than good oats or cake. The former is to be preferred, as aiding most in the proper formation of bone and healthiness of progress in the lamb, as also in the young sheep of the flock.

For the reception of the breeding flock as they are ready to leave the lambing field, the most suitable portion of the grass fields and grazing seeds should be "laid in" early in the winter, to which they should be drafted as the best judgment of the breeder dictates. If the pastures are very forward and fruitful, care should be taken not to turn thereon any but strong lambs; neither should the weaker ewes be permitted to go there, as the cold grass and cold rains incident to the early season may cause scouring. The change must be gradual for every weak animal, or much danger arises. Better to keep them on the barer pastures, or in the lambing field enjoying their customary allowance, than to run any hazard in putting them on strong and most probably at this time purgative grasses. As the season advances and the weather becomes warmer, they may be put on with safety. All that is required at this period is to "clag them," *i. e.*, to clip off a small quantity of wool from the inside of the upper part of the thighs immediately and about the tail, so as to prevent accumulations of dirt in that region, which in "fly time" is a

great enticement to their nasty and prejudicial attacks. It is not in accordance with good management to "lay them" on the pastures too thickly. Ewes, while suckling, always do best where they have plenty of room to rove about, and plenty of choice in their food to gather where they like. A mixture of store-sheep or fattening sheep with them is best, and then not too numerous. There ought in every pasture allotted to sheep to be a few cattle depasturing in addition; they eat of certain coarse and stronger grasses, which tends to improve the pasture for sheep. In the course of a few weeks it behoves the breeder to look well to them, as it is most probable they will require a change; they are delicately feeding animals, and if they take a dislike to certain spots in the field, from one cause or other, they will not feed there, and the consequence often is, that other portions are fed off too closely, and a loss in condition takes place. In such case, and in similar ones, exchange of field with other sheep will generally prevent this, and cause the field to be more evenly grazed. Many of these minor matters, if properly attended to, avail much in promoting the prosperity of the breeding flock. A change from a good pasture to an inferior one is frequently attended with advantage, contradictory though it be.

In the best-managed flock it will occasionally happen that lice, ticks, or scab may, unfortunately, intrude; and very annoying and trying it is, particularly the latter infection. In such cases, the breeder cannot be too cautious at this season. It is dangerous to use the common remedies. Arsenical mixtures, however diluted, are almost sure to have a fatal effect upon some of the suckling lambs, because, if you apply the "fag-water" never so carefully, the udder will be partially wetted; and then, should the lamb imbibe any quantity, it must receive injury, and probably die. Should it, however, be found absolutely necessary to dress the ewes, the lambs should, at all events, be kept from them for a few hours. To resort to mercurial ointments in cases of that dire pest, scab, is a most hazardous experiment. The best way in such cases is, "blotch them" till after clip-day, or till weaning-time. By "blotching" I mean, to dress any affected part showing itself with ointment, so as to keep the infection under till weaning-time, when both ewes and lambs will require dressing. Happy is the breeder who misses the latter pest.

The fattening sheep must, of course, have the richest pasturage; and, for the early part of the season, they should be supplied with mangolds daily. I say mangolds, because they are not only the best spring food, but have become universally grown, or speedily will be. An addition of corn or cake will add greatly to their progress. I believe that, taking into account the increase in wool and mutton, and the extra number which the pasture may thus be made to carry—that a

good daily ration of cake or corn is the most profitable mode of grazing. I know this: it is becoming universal in the best grazing districts; and while the price of wool and mutton is so profitable, it is likely to obtain general practice, and deservedly so. Another reason for it is, that young sheep (shearlings) are now generally fattened off, and in many flocks the hoggets also. Now this can scarcely be done with any breed, however high their fattening qualities may have attained to, without these artificial aids. No management can exceed the high keeping for such purposes. It may be expensive, but it is not all expended upon the animal: a beneficial result is found in the pasture, and every year it is found to increase in fruitfulness and the grass in nutritive value. There may be a limit to this artificial course of management, but I believe if judiciously carried out upon animals properly bred and properly managed, it is illimitable.

The store sheep, *i. e.*, the hoggets, guile ewes, and backward shearlings, may take the inferior pastures, for which they are qualified to graze; and these pastures are also suited to them. Inferior pastures are not

adapted for good animals: they deteriorate in condition rapidly; but inferior animals will thrive gradually upon them, and as they become fitted for the better herbage they should be removed and pushed on by the artificial aids named above. In any case the allowance of mangolds should be given, and a ration of corn or cake. In this way they will soon be ready to take the place of those sold off from the best pastures, and thus a considerable extra number may be fattened yearly. It is worthy of remark that such is the demand for animal food in this country, that every exertion should be made by every grazier to supply it. And no way can equal a liberal course of management pursued throughout his whole flock: it will pay in the number: it will pay in the wool: it will pay in the mutton: it will pay in the subsequent crops on all seed lands. It is an expenditure of tenants' capital for both immediate and prospective advantage. This is another grand reason for a more secure tenure and equitable tenant-right. The landlord cannot fail to be benefitted by such liberal management, and every enterprising tenant ought to have every encouragement to induce such expenditure.

NOTES ON MEADOWS AND PASTURES.

By JAMES BUCKMAN, F.G.S., F.L.S.,

PROFESSOR OF BOTANY AND GEOLOGY AT THE ROYAL AGRICULTURAL COLLEGE.

We have hitherto considered the meadow as being composed of grasses, in the which we have shown that a number of plants, other than grasses, take up a position as part of our wild or native Flora, many of which, so far from being of any service to the pasture, are so injurious as only to be considered as weeds.

But there is yet another section of meadow denizens, which are deserving of the greatest attention, namely, plants different from grasses, but yet possessing valuable feeding properties; whilst a few deserve notice either from appetetic or medicinal virtues, which entitle them to a place in the meadow, side by side with the grasses; some of which, indeed, from their possessing these feeding properties, are classed with grasses by gentlemen, editors of journals and others, whose propriety would be sadly shocked to hear one talk of "sparrow grass," and who yet will speak of clover as a grass. The objects, then, of this class, to which we now claim attention, will be those that are usually found forming part of the meadow; the nature of which will be best comprehended from the following list:

LIST OF MEADOW AND PASTURE PLANTS NOT GRASSES.

A. FEEDING PLANTS.

- Trifolium pratense*—Red clover.
- " *medium*—Zigzag clover.
- " *repens*—Dutch clover.
- " *fragiferum*—Strawberry-headed trefoil.
- Lotus corniculatus*—Crowfoot.

B. APETETIC, OR SALUTARY MEDICINAL PLANTS.

- Achillea millefolium*—Yarrow.
- Tormentilla officinalis*—Tormentil.
- Thymus serpyllum*—Wild thyme.
- Agrimonia eupatoria*—Agrimony.

a. Feeding Plants.—A meadow can scarcely be said to possess the highest character, unless it be capable of producing clover. At the same time, this idea must be carefully qualified, as it should not be concluded that any kind of clover is an evidence of condition, for even the few species which we have selected are sufficient to mark considerable variations in this respect, as will be seen from the remarks we now offer upon them.

Trifolium pratense in its wilder form—that is, in the shape in which we find it with natural pasture, when it springs up spontaneously; and in quantity—is an evidence that the soil is of medium or ordinary mechanical texture, as if decidedly sandy it would be almost absent, and probably the *T. medium*, or *T. repens* would take up its room; but if decidedly wet clay the *T. fragiferum* would be more likely to occur. The first then shows that we may have present sand, clay, and lime, where, as before observed, it flourishes well, where we have these soil-elements in the proportions best calculated for pasture growth. Hence, then, red clover is a plant of general occurrence; and if, in districts favourable to its growth, it should (as frequently happens) gradually decline, it is usually because these elements have lost their balance; and hence it is that lime—which is a substance more capable of being exhausted than either the argillaceous or the arenaceous matter of soil—from time to time gets deficient. So, then, the restoring of lime will result in the restoration of the clover, where it has declined from this cause of absence. Mere manures will not do it; but simply a dressing of lime or old mortar will often cause an immense growth of clover in the

meadow. And if in addition to this we add real fertilizers of the more stimulating or manurial kind, we shall find an increase not only in red clover, but in the best grasses, and other valuable elements of a rich pasture. This proposition is proved by an examination of the position in which the *T. medium*, the zigzag, or cow-grass clover, is usually found, namely, not side by side with the red clover, as the same meadow will seldom find them as allies in the struggle for dominion over other herbage; but where lime is present, the red clover will be the rule, and the cow-grass seldom interferes. And where calcareous matter is deficient, but sand is the prevailing soil-element, there the cow grass will be the rule, and the red clover the exception. So, then, when we see a broad-leaved clover on the mixed soils of the calcareous deposits of a great part of England, we shall usually find it to be red clover, and the cow-grass will be very rare, as it is in the Cotteswolds; and where it does occur, it will be on account of some accidental sand deposit in the midst of the otherwise calcareous beds; but if we examine the sand lands upon the merely comminuted silicious rocks, the cow-grass will be the prevailing clover. Hence on the sandstone hills, in South Wales, Scotland, and even Ireland, it would be difficult to find the common red clover, while the cow-grass clover is very plentiful.

It was doubtless the fact of observations of this kind, relative to these two forms of clover, that suggested the bringing of the cow-grass into cultivation; for as the red clover was found to be but little permanent on light or sandy soils, and the cow-grass was found to be more so, it got into the seed market under the title of *perennial* clover.

In order to an understanding of the differences in these two plants, we copy the following descriptions from "English Botany," 2nd Edition.

"*Trifolium pratense*; Purple Clover.—Stems ascending, stipules ovate, bristle-pointed. Heads ovate, dense. Calyx hairy, four of its teeth equal, the lower one longer; petals unequal.

"Common in meadows and pastures, but more certainly wild on calcareous hills. Stems about a foot high, branched. Leaflets elliptical, more or less acute, or obcordate; generally with a pale lunulate spot toward the base. Lower-tooth of the calyx about half as long as the tube of the corolla. Flowers produced throughout the summer, reddish purple.

"*Trifolium medium* (Zigzag Trefoil).—Stems branched, zigzag; leaflets elliptical. Stipules tapering, converging. Heads lax, subglobose, solitary, terminal; two upper-teeth of the calyx rather shorter. Petals nearly equal."

"Frequent in dry and rather elevated pastures. The zigzag stems, spotless leaves, and larger and less compact heads of flowers distinguish this from *T. pratense*. Corolla deep purple."

These descriptions show us the botanical distinctions of these two plants in their wild state; but if we take up their cultivated forms with a view to make out these differences, it is astonishing what an amount of confusion we shall get into, the fact being that the one has so merged into the other, that it is oftentimes next to im-

possible to make out any decided botanical characters; and this is so well known to seedsmen, that they have for some time ceased to pretend to supply *Trifolium medium* under that name, but now adopt the term *Trifolium pratense-perenne*, to distinguish their agricultural cow-grass from broad clover.

We quite think the term fully justified, as there can be but little doubt that they are, after all, only varieties, and both the *T. pratense* and the *T. medium* forms become so much changed by cultivation, that it has given rise to no end of disputes as to what should be the proper qualities of either, so that if either is to possess the permanency it once did, seed must be newly obtained from the original wild sources. Still, as we meet with them in pastures, the *T. pratense* will indicate calcareous soils, and the *T. medium* no less those of a silicious nature; and they are, therefore, no bad *indicia* of the nature of the soil.

The *Trifolium repens* is a plant of good character in herbage. It usually increases where lime has been added to the meadow, and more especially if well trodden by depasturing, and it should be periodically rolled. In laying down permanent pasture it should never be left out, and indeed this, and either of the preceding forms, according to the nature of the soil, should never be omitted.

In all examinations into the nature and condition of meadows, care should be taken to ascertain if the species be really the *T. repens*, white Dutch clover, or the *T. fragiferum* (the strawberry-headed species), as the latter is fond of wet clays, in which we are inclined to think it is oftener present than is generally conceived; but if depastured, its head of persistent coloured calyces, which has the aspect of a strawberry, is seldom perfected; still the white flowers just blushed with pink are sufficiently characteristic.

The genus *Lotus* is often found as part of the herbage of a meadow. It needs no further notice except to point out that its species, as well as others of the *papilionaceæ* or pea-flowered plants, are always useful as adjuncts to pasture, and there is not, to our knowledge, a prejudicial plant amongst them.

b. Salutary plants are those that are not meritorious merely for their feeding properties, which indeed may be very poor in some of the forms, but there can be but little doubt that they act as condiments, or perhaps as *stimulants*, *narcotics*, or *astringents*, and so have the effect of preventing that tendency to scouring which is too often the effect of vapid food. If we examine into the causes of the difference in the nutritive value of meadow as compared with what is termed *artificial* hay, we shall find that the former has little flavour; in fact, the rye-grasses and clovers by themselves are anything but aromatic; but meadow hay, and more especially where the herbage is of very mixed character, is always full of aroma, and much of this is due to the presence of the *Anthoxanthum odoratum*, or sweet-scented vernal grass, which indeed ought to have been put under this head, had not our object been to speak of plants other than grasses.

Now, we frequently find a mixture of grasses and

aromatic plants in mountain pastures on dry soils; but if on heavy clays, we have coarse, or what may be called "sour grasses," mixed with quantities of the *Linum catharticum* (purging flax), in which latter case *scouring* would be as sure to be produced as it would be to be cured

by depasturing the former. These facts teach us that besides graises there are several other plants useful in herbage, the effects of which, though various, may be summed up under the heads of *alimentary* and *medicinal* adjuncts to pasture.

LONDON, OR CENTRAL FARMERS' CLUB.

THE MANUFACTURE OF MANURE.

The usual monthly meeting of this club was held on Monday evening, April 1, at the Club House, Blackfriars; Mr. SKELTON presiding. The subject for discussion, standing in the name of Mr. A. Ruston, of Aylesby House, Chatteris, was, "Sheep v. Bullocks as Manufacturers of Manure, on farms where the produce is not fattening, and no roots but mangolds can be grown." The attendance was very small, which the Chairman explained to be in consequence of the holiday time, the parish business on at Easter, and the number of members who were out with the different Volunteer Corps.

Mr. RUSTON said: "Live and learn" is an old trite saying, which the ever-changing hand of Time has left untouched, and which is as forceful and suggestive now, as when the world first heard it. We live to learn. The human mind places no limit to its acquisition of knowledge; but the more it acquires, the greater restlessness it evinces in its search after more. Energy and activity characterise our national life. New inventions and discoveries succeed each other in such rapid succession, that we scarcely rise to the comprehension of one, than it is succeeded and superseded by another, still more marvellous and exciting. Life becomes a school of laborious toil: genius and intellect are heavily taxed, not only in inventing and discovering, but also in keeping pace with, and turning to the best practical account, those many valuable inventions and discoveries which so thickly crowd upon us, in these days of active enterprise and untiring energy. The ceaseless claims these present upon our attention and investigation preclude the possibility of mental inactivity and sloth. If we would live up to the times, we must work hard, and be diligent students of the world's every-day occurrences. And it is satisfactory to find that amid all this progression and advancement and fast living which surround us, agriculture has not remained stationary, but has been amongst the foremost in its onward movements. Science, and mechanical skill and genius, have alike largely contributed to this result. Improved machinery, deep-drainage, the steam-engine, the water-drill, and agricultural chemistry are amongst the comparatively modern contributions to British agriculture, which have invested it with a deeper and more universal interest, and have rendered the cultivation of the soil a study and a science. And we are still advancing. *Onward* is yet our motto. No sooner, for instance, had the plough reached such a state of perfection, both as to its manufacture and mode of operation, and had superseded and thrown on one side those antiquated things with which we used to grub through the soil, and which in our simplicity we called ploughs, and had excited in our minds the firm belief that no further improvement was now possible, than our Elysian slumbers were disturbed by the shrill whistle and loud cry of "steam culture." The

steam-engine, hitherto so useful in the stackyard, is to be dragged into the field, where still greater success awaits it, and is doubtless destined very soon to supersede, to a great extent, those very ploughs which we had just regarded with so much favour, and which appeared to us such models of perfection. Agricultural chemistry, too, is constantly making its discoveries, and is daily presenting its newly-ascertained facts for our instruction and guidance; facts which are not only oft-times startling, but which are frequently of great practical value, teaching us how to secure the greatest possible results at the smallest possible cost. But besides these subjects of larger and more general interest, there are many other questions of minor, yet of practical importance, which are engaging the attention of farmers in their respective localities—questions which local circumstances and peculiarities may to some extent tinge and influence, but questions nevertheless which are worthy the patient consideration of a body of intelligent agriculturists, whose motto is "Onward," and who seek yet to "live and learn." The subject to which I have more immediately to invite your attention this evening is one of these. It admits of only a limited application, but is, notwithstanding, fraught with interest to all those who, like myself, are farming in the great level of the Fens, as also to all others whose circumstances in other respects resemble ours. The subject as I gave it to the committee reads thus: "How far sheep can be advantageously substituted for bullocks in the manufacture of manure, upon farms where the natural food is not fattening, and where no roots but mangolds can be successfully grown." But to adapt it for the card, it has been put in a slightly different form, viz., "Sheep versus Bullocks as manufacturers of manure, on farms where the produce is not fattening, and no roots but mangolds can be grown." In considering the subject this evening, I shall take the wording of it as given to the committee, as it is rather more clear and explicit, or as "A Practical Farmer," who affects to be a critic, would say, "not so much involved." It must be my business this evening to endeavour to evolve all these involutions, of which my cynical friend so strongly complains. As I have already intimated, my farming life has been spent in the great level of the Fens. Formerly, these lands were submerged during the winter months entirely, and supplied fresh-water fish for the sustenance of the small and scattered population which inhabited the higher grounds, technically termed "high lands." These elevated plots of ground were free from the influences of the surrounding waters, and were cultivated, and produced corn, and now form the sites of the different towns and villages which are found in the Fens. Successive schemes for draining these low and inundated lands have at different intervals been designed and executed, until they have at length become effectively drained,

and present a large stretching flat of fertile and productive land. Heavy crops of corn are grown upon them, frequently more bulky in straw than richly laden with grain. Mangolds grow well upon these soils, and heavy crops may be produced. Rye-grass appears better suited than clover to fen lands generally, and bulk rather than quality is afforded. But although the land produces plenty, yet the quality of all is inferior. Even the grain is commonly of a low quality, except in very peculiar and favourable seasons. The straw, as also the rye-grass and clover hay, are generally coarse, and contain no really feeding properties. Mangolds too, which grow so freely, and afford such an abundance of keeping, possess but a small percentage of nutriment, but contain too much water, and too little saccharine matter. Straw, seed-land hay, and mangolds, then, are the three varieties of food, which, on the farms to which we are referring, are produced, and have to be consumed in the fold-yard during the winter months. And none of these, either separately or combined, will fatten an animal. They may slightly improve his condition, but will never make him fat, if kept upon them to the end of time. Artificial food must be very freely given, if an animal is to be made fat and fit for the butcher on a Fen farm of average quality. Stall-feeding is, therefore, too expensive a practice to receive very general adoption. The more common custom is to buy lean cattle in the autumn, giving them the produce of the farm, with a small quantity of cake or corn, during the winter, and selling them in somewhat improved condition in the spring. From what I have seen of bullock-feeding in the yards in North Lincolnshire, I entertain the decided opinion that, in a given time, a bullock will acquire a given weight, with four to six pound less cake per day there, than he would on any of the farms I occupy; simply because the natural food is so much more fattening. And I am supported in this view by North Lincolnshire farmers of eminence, who have witnessed my efforts at feeding, and have compared them with their own. I have said thus much, simply to convey to this meeting what I mean by the words on the card, "On farms where the produce is not fattening," or, as it should read, "Upon farms where the natural food is not fattening." One further explanation is required. The card proceeds to say, "and no roots but mangolds can be grown," which should read "can be successfully grown." 'Tis true, turnips may be sown; and something with a coarse long neck, and a small woody fibrous bulb, will be the result. But what is it worth when produced? Simply, nothing at all, except to make lean bullocks and sheep still leaner. I have had some experience in this matter, and such experience has taught me "never to do the like again," and enables me to assert most positively, that, on all farms resembling my own, turnips cannot be successfully grown. Mangolds, as I have before stated, grow well, and yield a large crop, although not of a fattening quality. I need not dwell longer in defining the terms of my subject, as I have said quite enough in elucidation and explanation of the so-called "too involved" terms in which it is couched. How far other districts of the country may resemble my own I cannot tell; but of course the remarks I have already made, and those I am about to make, apply only to those where there is some degree of similarity. Of necessity the whole of the turnip districts of the country are excluded. As already observed, these fen lands of ours grow a heavy crop of mangolds and a bulky crop of straw, although the quality is inferior. And I may here further remark, that a crop of mangolds does not appear to impoverish the land where properly cultivated

but the whole may be drawn from the field upon which it has been grown, to be consumed where circumstances may direct, without any apparent loss being sustained by the following cereal crop. As a rule, in average seasons we grow an abundance of straw after mangolds. This is important, as it enables the whole crop to be drawn near the fold-yard, to be there consumed if deemed desirable. We are then brought to this point: We have the corn standing in the stack-yard, ready to be thrashed, that the straw may be converted, during the winter months, into manure; we have the mangolds also carted into heaps in the neighbourhood of the fold-yard, ready to be consumed; and we have the hay stacked there too, for the same purpose—at least so much of it as is not required for the work-horses. The question then arises, How can this straw be manufactured into manure, and this accumulation of food consumed most profitably? Can it be best effected by bullocks or by sheep? Doubtless many would at once exclaim, "By bullocks," and would in haste endorse the sentiment of "A Practical Farmer," to whom I have before referred, who, in a popular agricultural journal, in speaking of me and my subject, says, "Sheep are unquestionably useful for folding in the fields, but not equal to cattle in the fold-yard." Possibly this meeting may entertain very similar views to these, and may be led to the utterance of similar sentiments. Be it so. I am not here to dogmatize, or to arrogate to myself superior wisdom in these matters. I rather seek to "live and learn" than affect to teach. But I would wish, modestly to place before this meeting a few facts, which I have acquired from actual experience upon this subject. Facts, it is said, speak louder than words. In this instance, then, let the facts go for what they are worth, and let them exercise their legitimate influence in the formation of our individual opinions. In a former part of this paper I have intimated that the more common method of converting our coarse straw into manure, and of consuming our mangolds and inferior hay, has been by purchasing for that purpose some growing bullocks in the autumn, giving them a few pounds of cake or corn per day, in addition to the natural food, and selling them again in the spring either at our home fairs or at Norwich or in some other grazing district. If the bullocks have kept healthy and thriven well, they have occasionally left 20s. or 30s. per head for the natural food consumed; but it has been far more frequently the case that they have only just paid for their artificial food, and the mangolds and hay have had to be charged to the manure account. This mode of management was not very satisfactory. But the case has become even worse during the last few years, since the appearance of the lung disease, and our losses from this cause alone have been fearful. It is not, then, to be wondered at, that with no profits under favourable circumstances, and with heavy losses under these adverse circumstances, that we should anxiously inquire, Cannot we make our manure and consume our winter food without being compelled to sustain these heavy losses? In other words, cannot we dispense with bullocks altogether for this purpose? At the first it appeared very doubtful whether such a thing could be, and we were inclined to fear it would prove an impossibility. But continued and severe lung disease urged us to the trial. Numerous difficulties and objections had to be weighed and deliberated upon. It was said sheep would tread down no quantity of straw, and we should never get our great straw stacks made into manure fit for the land at all; it would be an utter impossibility. It was also said that sheep would suffer from foot-rot, and would lose condition by lying on the

hot manure and treading constantly upon wet straw; and it was further objected that the manure made by sheep would be much inferior to that made by bullocks, and our crops would consequently suffer. These formidable and multiplied objections staggered us. Still, we remembered that sheep were annual sources of profit to us, whilst bullocks were annual sources of loss. When our whole winter food was consumed by bullocks, as we do not breed, we were driven to buy our sheep for the summer grass at the spring fairs, and generally had to pay a stiff price for them; but notwithstanding all this, they still paid, but not so well as if they had been purchased in the autumn. The question then presented itself with great force, If there is a good profit on sheep for keeping them from the autumn till the spring, whilst there is none upon bullocks, why not try and consume our food, and make our manure with sheep, and thereby secure this good profit? These reasonings at length, combined with that destructive lung disease, triumphed, and the trial was made. I have now tried sheep in yards for five years. During the three first years I had only a few. Last year, the lung disease appearing in a lot of Scots I had, excited my fears lest it should spread and decimate another lot which I had just received from Scotland. I therefore determined at once to send the latter lot away, and sell them again, keeping only those in which the disease had appeared. This drove me to the necessity of purchasing nearly 400 lambs for the purpose of consuming my hay and mangolds, and of manufacturing my straw into manure. I made very close observations, kept a diary of all necessary particulars, valued them into the yards, and valued them out to grass, with the dates of going in and out; I also calculated to a fraction their cost for artificial food, noticed very narrowly what quantity of straw they made into manure, and also the quality of the manure, as far as appearances enabled me to judge; noted every loss and its assigned cause, full particulars of which I will hereafter present to the meeting, with other facts which the experiments disclosed. But before I give these, I wish to make a few remarks upon the general management adopted, and the information it afforded. From close and careful observation last winter and again this—for I have now between 600 and 700 sheep in yards—I find six lambs will tread down as much straw, and make it into good manure, as a £12 or £14 bullock. Some of my men say five will, but I hesitate to assert this, but speak confidently when I say six will. I put the sheep just into my ordinary fold-yards, and always calculate six sheep to one bullock; so that where I should have ten bullocks I put sixty sheep. During the whole of last winter I don't suppose I had more than a dozen lame sheep whilst they were in the yards; this winter I have had more, as many of them came lame into the yards—arising, I suppose, from the wetness of the last summer. I may, however, say, there have been far less cases in the yards than there were previously to their coming in. I find it is very essential to keep a thin layer of dry straw over the yard. In wet days we litter them twice a-day, and on fine days once, but we only use a small quantity at a time; this just keeps the heat of the manure from rising to injure their feet, and prevents them also treading on wet straw during the day. When they first come into the yard, and indeed until the end of February, when the days begin to lengthen, we give them a larger quantity of dry food; they pick the bedding straw over, and where practicable have a stack or good heap in the yard to run to; we also cut them chaff, hay, and straw together, and feed them several times

a-day with it. We give them a few mangolds twice or thrice a-day, but not in quantities sufficiently large to make them scour; but as the days lengthen we increase the quantity of mangolds, and reduce the supply of dry food. I find an acre of mangolds of an average crop will carry 25 sheep, i. e. 25 lambs, during the weeks they will require to be in the yard, say from the beginning of December to the beginning or middle of April; old sheep would consume more, and 20 per acre would be a fair calculation. I will now present some details in connection with my last year's experiments. The 377 lambs wintered in the yards last year were bought during the months of August and September, and were kept entirely at grass-keeping, without artificial food, until December, when they were consigned to their winter quarters. Lot 1: 94 lambs were bought August 22, at an average cost of 30s. 2d. per head, and were valued into the yards on the 10th of December at 35s. per head. In addition to the natural food already so frequently alluded to, viz., mangolds, hay and straw, they eat $\frac{1}{4}$ pint of oats and $\frac{1}{8}$ lb. of cotton cake per day, at a weekly cost of $1\frac{1}{2}$ d. per head. Six of these died or had to be killed at intervals during the winter, from different causes, particulars of which I have before me, but which I need not stay to enumerate. The remaining 88 were put to grass on the 14th of April, valued at 50s. per head, having been in sixteen weeks. Lot 2: 96 lambs were purchased on the 13th September, and cost 30s. 6d. per head. These were put into the yards on the 3rd December, valued at 34s. per head, and were kept precisely the same as lot 1. Four of these died, or had to be killed before they left the yards; the remaining 92 were put to grass on the 14th April, valued also at 50s. per head, having been in sixteen weeks. Lot 3 and lot 4 (84 and 103 respectively) were bought at different times during the month of August, at prices ranging from 25s. 6d. to 28s. Lot 3 (84) were put into the yards on the 3rd of December, valued at 32s. 6d. per head, and lived the same as lots 1 and 2. Only one of these died during the winter, and the remaining 83 were put to grass on the 14th of April, valued at 48s. per head, having been in sixteen weeks. Lot 4 (103) were put into yards on the 3rd December, valued at 30s. each. These, too, were fed the same. Two had to be killed during the winter, and the 101 remaining were put to grass on the 21st of April, valued at 48s. each, having been seventeen weeks in the yards. The results when tabulated will stand thus:—

LOT 1.

	£	s.	d.	£	s.	d.
94 at 35s., December 10th	164	10	0			
Artificial food, at $1\frac{1}{2}$ d. per week, on 94	8	16	3	—173	6	3
88 at 50s., April 14th	220	0	0			
6 casualties	3	15	0	—223	15	0

Leaving for 15 weeks' keeping and attendance

50 8 9

LOT 2.

	£	s.	d.	£	s.	d.
96 at 34s., December 3rd	163	4	0			
Artificial food, at $1\frac{1}{2}$ d. per week, on 96	9	12	0	—172	16	0
92 at 50s., April 14th	230	0	0			
4 casualties	3	7	9	—233	7	9

Leaving for 16 weeks' keeping, &c.

60 11 9

LOT 3.

	£	s.	d.	£	s.	d.
84 at 32s. 6d., December 3rd	136	10	0			
Artificial food, at $1\frac{1}{2}$ d. per week, on 84	8	8	0	—144	18	0
83 at 48s., April 14th	199	4	0			
1 casualty	0	7	0	—199	11	0

Leaving for 16 weeks' keeping, &c.

54 13 0

LOT 4.

103 at 30s., December 3rd.....	154	10	0
Artificial food, at 1½d. per week, on 103.....	10	18	10½
101 at 48s., April 21st	242	8	0
2 casualties.....	2	6	6
			—244 14 6

Leaving for 17 weeks' keeping, &c	79	5	7½
From these figures it will appear that the whole 377 lambs were valued into the yards at..	618	14	0
and that they cost for artificial food	37	15	1½
making a total cost of.....	656	9	1½
and, further, that the 364 put to grass were valued at	891	12	0
and that the 13 casualties realized	9	16	3
making a total of	901	8	3
which shows a profit on the whole of.....	244	19	1½
which I dispose of as follows, viz.: hay, straw, attendance, at 3s. per head, for 377	56	11	0
15 acres mangolds, allowing 25 sheep to the acre, at £12 11s. 2½d. per acre.....	188	8	1½

or, if you take two acres more mangolds, and call the total quantity 17 acres, it will then give you £11 1s. 8d. per acre for them, within a fraction; but I regard the former as the more correct calculation. As I previously stated, I suffered last year—as indeed I had done for three or four years—from lung disease with my bullocks, and sustained some rather serious losses. The lot of Scots, to which I have referred in an earlier part of this paper, as having last year been afflicted with this terrible disorder, were bought on the 12th of March, 1859, and cost just £8 3s. 4d. per head when they reached my farm. They were put upon a very good (for our country) field of grass, and made considerable progress, and on the 1st of July of the same year, when taking stock, with a view to closing and balancing my year's accounts, I valued them at £11 per head. On the 29th of October they were put into yards, and I then valued them at £12 10s. per head. But before that time—during September I believe—two of them were seized with lung disease, and, after some two or three weeks' doctoring and dosing, had to be killed. There were therefore only 24 left for the yards; and by the 3rd of December these were reduced to 18. Some of the best bullocks fell, and I found the better plan was to dispose of them at once, before they sustained any serious harm. Two were therefore sold on the 11th of November for £14 17s.; two on the 18th for £17 17s.; one on the 29th, which realized £6 3s., and one on the 3rd of December, which realized £6 17s. After the 3rd of December no more disease appeared, and I kept the eighteen until the 2nd of February, 1860, when they left me in good health; but went to a bad market, keep being very short last spring, and they brought home, clear of expenses, only £12 11s. 6d. per head, or just 1s. 6d. per head more than they were worth on the 29th of the previous October. During the time they were in the yards they consumed chaff—half hay and half straw—and 3 lbs. of the best decorticated cotton seed cake each per day. They had no mangolds, as they were at a farm where none were grown that year. The cost per head for cake was £1 1s. 6d. The six that fell with lung disease made £29 6s. less than they were valued at when they went into the yards, and the eighteen that did not suffer lost £1 per head on the cake account, besides all the hay, straw, and attendance—rather a costly yard of manure! I have given these particulars to show the relative merits of bullocks and sheep, as manufacturers of manure during the Winter of 1859-60, as indicated by my own experience, and to inquire—being influenced by these facts—how far sheep can be advantageously

substituted for bullocks in the manufacture of manure under certain specified circumstances. The reply to this inquiry, if guided by the foregoing facts, will assuredly be in favour of the adoption of sheep in preference to bullocks for this important work. But perhaps the last year's test could scarcely be taken as a guide for our future action. The lung disease appearing amongst the bullocks occasioned a loss, which might not occur again. And the last Spring too would hardly be regarded as affording a fair criterion from which to judge of the usual profit for wintering growing cattle. The shortness of keeping was so severely felt, that animals could only be transferred to new owners at a wretchedly bad price—i. e., if sold, as mine were, before the grass season arrived. But independently of these specialities and drawbacks, the argument is in favour of the use of sheep. Although the loss from lung disease last year may appear excessive, no man can secure an immunity from its ravages another. He may fortunately escape, or he may not. But take the most favourable view of the case, and suppose his cattle are all healthy, and are bought well, according to their value at the time; let them thrive satisfactorily during the Winter months, and go in the Spring to a good market, the prices then corresponding to the prices paid in the Autumn—given all these favourable circumstances, then, as it respects the bullocks (which, by the bye, must not always be expected to be realized), I would still choose the sheep. Let us look at the case a little further. It has rarely been my lot to make more than from 20s. to 30s. per head beyond the cost for artificial food for wintering bullocks. When this has been done, we have been wont to denominate it a good year. I am anxious now to compare, not merely an average, but a decidedly good bullock year with last year's sheep. We have seen how a bad bullock-year compares with them; let us try a good one, and see how that will work out. Take a case, then, where 30s. per head has been realized for the natural food consumed during the months that cattle have been in the yards. For treading down straw I have said that six sheep are equal to one bullock. Let us now for a moment consider what six sheep will consume, as compared with one bullock. According to my own mode of management—and I am now arguing from my own practice—one bullock would consume as much hay as twenty sheep. From observation I find a rather light crop of hay will yield sufficient for forty sheep per acre, and I usually, with bullocks, calculate half an acre per head, which tallies exactly with what I have just stated, viz., one bullock to twenty sheep. An acre of mangolds will carry twenty-five sheep during the time they are in the yards, as I have previously observed; and the same quantity would supply six bullocks for the same number of weeks as nearly as I can estimate it. In round numbers, then, it will appear that one bullock will consume rather over two-thirds more hay than six sheep will, and that six sheep will consume one-third more mangolds than one bullock will. Without further minute details and calculations, and to avoid being tedious, we will assume, then, that the cost for natural food for six sheep and one bullock is precisely the same. How then does the matter stand? And I again remind you that I am supposing a good year for bullocks, where there is not only general thriftiness, but also exemption from disease and death. It will be seen, then, that in such a year, where the very uncommon profit of 30s. per head is secured for the natural food consumed, that one bullock will return as much profit as two-and-a-half sheep, or a trifle over, and will yet have cost as much keeping as six sheep. The figures will

stand thus—Profit on one bullock, £1 10s.; profit on six sheep, which have consumed the same amount of food, and made the same amount of manure, £3 18s. Excess of profit on account of sheep, all other things being equal, £2 8s. The sheep calculations are all based upon the figures contained in the tables to which I have just invited your attention, where it appears that 377 sheep paid £244 19s. 1½d. for the natural food consumed in the yards, including all losses. This year I have, as before stated, upwards of 600 sheep in the yards. To simplify the matter, suppose I say I have 600 exactly; these are consuming the food and making the manure that 100 bullocks would consume and make. Taking £1 10s. as the profit per head on 100 bullocks, and £3 18s. the profit on six sheep—and I think the latter is quite as likely to be realized this year as the former, and indeed more so—what is my position then? Why, instead of getting £150 for the food consumed by 100 bullocks, for the very same food consumed by 600 sheep, I get £390; which simply puts £240 into my pocket, and emboldens me to stand here and argue in favour of sheep as manure manufacturers. There is just one other argument I would adduce, which appears to strengthen the case in favour of sheep, so far as the fens are concerned. A brief allusion to it will suffice. It is this—Our fen soils appear naturally more adapted for sheep than bullocks. Coleseed, which grows very freely upon them, is very fattening, and perhaps there is no vegetable food that sheep can consume that will give them so much firmness of hand, and so large an increase of weight in a given time, as good fen-land coleseed. It is incredible how rapidly sheep will sometimes get fat upon it. Clover and ryegrass, the common herbage on a fen farm, is far more suited to sheep than bullocks. Sheep, with an occasional change, will thrive well, and upon clover eddishes will get good mutton, especially if a small quantity of cake is given to them. Bullocks do not generally thrive well on our fen lands, and unless they have frequent change to high lands, they will soon become diseased and unhealthy. A long continuance on these lands, and with no food but what the farm produces, is almost sure to result in ulcers, and a consequent wasting of condition. Before the introduction of linseed cake, ulcerated bullocks were far more common in the fens than now. But this, although tending to mitigate, does not prevent the disease; and we have every year ample evidence to convince us that fen land is not healthy for bullocks. We have plenty of land that will feed a sheep, that, if it will not starve, will do very little to mend a bullock. It seems only fair then to assume that as the herbage on these lands—i. e., the rye grass and clover—in its green and growing state, is so much better food for sheep than for bullocks, that the same herbage, when mown and made into hay, should retain the same superiority and fitness for sheep over bullocks. I cannot see that drying up its juices by the summer's sun will in any way alter its distinctive peculiarities; and further, it seems equally fair to assume that mangolds grown upon land which in every sense is better suited for sheep than bullocks, should themselves also be better food for the former than for the latter. Doubtless it is so, and goes, in my own immediate neighbourhood, as indeed in all others where similar testimony may be borne, to strengthen the case in favour of sheep, and is another argument for employing them as manure manufacturers. From the tables given in another part of this paper it will be seen that the cost for artificial food for my sheep last year was small, the whole 377 only consuming what cost £37 15s. 1½d. But, of course, this was quite optional, I

wanted my sheep for a certain purpose, and I kept them accordingly. From the yards they went upon some old pasture land, and in July upon clover and Timothy-grass eddishes, and in August and September to coleseed. They went to market from September to the end of the year, and made about 55s. to 56s. per head, leaving 15s. to 16s. per head for wool besides, being a total of 21s. or 22s. per head for summering. Where it is an object of great importance to make the manure of very superior quality, of course more artificial food must be given. This may be exactly regulated to meet the requirements of any and every case, without in any way interfering with the principle I am discussing. I sow all my *fen oats*, as well as my green crops, with artificial manure and the water drill, and also on my coleseeds and grass seeds give my sheep cake. This leads me to manufacture my yard manure at rather less cost; but this is not a point worth arguing—every man has his own ideas as to what his own farm requires; and whether he employs sheep or bullocks to make his manure, he gives them cake or corn accordingly; and, as I have just intimated, the principle remains the same, whether larger or smaller amounts of purchased foods be given. In an early part of this paper I referred to an objection which had been raised against sheep as manure manufacturers, viz., that the manure made by these would be inferior in quality to that made by bullocks. I looked closely into this to see, as far as appearances and observation would enable me, if these things really were so. I confess I have hitherto been unable to detect any such inferiority. It was a question, however, of such serious import that I considered and re-considered it, and did my utmost to ascertain if there could be any semblance of truth in it. I could not comprehend how it could be that, all things being equal, manure from the one animal should be so inferior to that from the other. The more I reflected upon the subject, the more perplexed I became, and the more sensibly felt my inadequacy to grapple fully with it. Reflection only produced a consciousness that the question was beyond my reach, and required a loftier knowledge than I had yet attained to satisfactorily explain it. It was evidently a question for chemistry to determine; so I resolved to make an immediate application to Mr. Lawes, knowing that he had devoted much time and attention to experiments of this nature, and feeling assured that any opinions expressed by him with reference thereto might be adopted. I accordingly stated my case, and in the following words you have his reply: 'In answer to your questions, I have no reason to suppose, that the manure from sheep or bullocks eating equal quantities and quality of food would differ in value, and you will be quite justified in assuming that the quality of the manure depends upon the food consumed, irrespective of the animal.' This appeared quite satisfactory, and accorded with my own experience, so far as such experience enabled me to form an opinion, and just removed the last little hovering doubt that disturbed my peace, as it ever now and then prompted the fear that my manure might not be so good as if it had been made by bullocks. When I accepted the invitation of the committee, to prepare a paper on the subject, to which your attention has been this evening invited, I felt it important that some other testimony than my own should be presented. I therefore applied to two or three gentlemen, who I believed could furnish facts that would be both interesting and instructive, and would reveal how far, in other localities than my own, the system of manufacturing manure by sheep had found favour, and had proved successful. Through the kindness of Mr. James

Howard I have received some particulars respecting the "yarding of sheep" in Essex. These have been communicated by Mr. William Delf, of Great Bentley Hall, near Colchester, and are derived, Mr. Delf says, not only from his own experience, but also from that of other gentlemen in the neighbourhood. Mr. Delf says: "In offering a few remarks upon the desirability of placing sheep in the yard during the winter months, it must be premised that the sheep is a better-paying animal for the food it consumes than the bullock. The advantage to be obtained by this system is much greater on a heavy-land farm than on a light-land farm, inasmuch as we are enabled to consume the bulk of our roots in the open field as grazing land; on heavy land it is very different, as most of the food in winter must be carted off the fields upon which it grew. I have found the yarding of sheep a great advantage in enabling me to consume the food (and thereby converting it into manure) near to the spot where the roots may have been grown, whereby a very great saving is effected both in carting the roots to the homestead and the return of the manure to the field. In forming a yard in the open fields, that is simply done by using rather deep hurdles, say five feet high from the ground, in order to admit of the accumulation of manure; by this plan you make your manure heap just where you want it, and turning over once or twice, it is ready for use. In placing sheep in a homestead-yard, care should be taken to have a current of air through the yard, and not closed all round. Having determined thus far, I will detail a few particulars, which we consider most important to be adhered to. As a rule, I prefer lambs to older sheep for yarding purposes. Then, again, the breed has a very great deal to do with the successful issue of the plan. West-country lambs are to be carefully avoided, and all dark-faced sheep in general, as being more susceptible to disease than any other kinds. The best description of lambs is half-bred Down (Oxford Down), Leicester, and Cotswold; the whiter the face the better. I will suppose, then, that the lambs have been selected. They ought to be in the yard by the middle of October, but not confined to the yard all at once. A fortnight or three weeks should be set apart for getting them to the straw gradually. For that purpose let them run into the yards at night, and out again the first thing in the morning; by degrees increasing the duration of their confinement to the yard, until they are kept in entirely. A space of four square yards should be allowed for each sheep, as over-crowding is very injurious. It will be supposed that the foot disease is the great difficulty to contend with. To combat this enemy it will be necessary to pare every foot closely before placing the sheep in the yard; and again at intervals of time not greater than three weeks, for the accomplishing with the knife what under other circumstances would be effected by the wear of the horn on the land. If a supplementary diet be given, it should consist of cut chaff, pollard, or oats, rather than peas, beans, &c., which we consider too heating for sheep in the yard, inasmuch as such food predisposes to the foot disease. Frequent littering of the yard must be attended to; wheat straw being used if possible, in preference to barley straw: in fact, a clean surface should be always kept; and that will be best accomplished by giving a slight covering every morning. From my own observations, I am inclined to believe that both mutton and wool may be grown quite as advantageously in the yard as in the open field; and as regards the consumption of the root crop upon heavy land, the yard system possesses much advantage." My next application was to

Mr. David Martin of Wainfleet, who for several years has farmed in the Isle of Ely. His son, Mr. Gilson Martin, in replying, says: "Last year I had 120 sheep in a yard most of the winter; they had mangolds, with half a pint of barley and half a pound of linseedcake per day: they thrived very well, and made a great quantity of manure. To prevent lameness I had them turned out three or four hours every day, which I found to answer very well. This year I have about 200 sheep in a yard eating cut mangolds and half a pound of cottoncake per day, and they are progressing very well. I am of opinion that sheep are a valuable auxiliary in the manufacture of manure in districts where a great quantity of straw is grown; and mangolds are the only roots that can be successfully cultivated." Mr. Martin says he has this year omitted to turn out his sheep during the day, as he found it was unnecessary to do so. The only other testimony I shall adduce is that of Mr. John Fryer, who is a near neighbour, residing in the same town and farming in the same parish as myself. Mr. Fryer says: "Having had occasion, six years ago, to keep a lot of ewes for some months during the winter entirely in the yard, fed on mangold and oats, I was so pleased with the great quantity and excellence of the manure they made, that I kept 100 lambs the following year all the winter in the yards, and with a like good result in manure and condition of sheep. I have gradually extended the system until this year I have had 400 ewes, shearlings, and lambs 'yarded' the greater part of the winter. The lambs being kept at a cost of 6d. per head per week on mangold, oats, and chaff; and the shearlings at 1s. per head per week, on the like food, with a small addition of cake: some of the latter have gone to market from the yard at 59s. each. I ought to refer to a difficulty I had on two occasions with foot disease. Once I attributed it to a deficiency of litter, allowing the sheep's feet to come too closely in contact with the heating manure; and the other time to sending out the sheep for an hour or two in the middle of each day for a run over a stubble field. I found that small clods and stubble got frequently between the claws, and drying hard on the warm manure, occasioned lameness. I have remarked that 'yarded' sheep thrive remarkably fast if kept in quite late in the spring, and only turned out when the grass is growing fast. The brief summary of my experience of the system is this: sheep in yards make more manure than beasts with a less outlay of capital, and with more profit. I scarcely ever got a profit, often a heavy loss, on the wintering of store beasts. I never had a loss on the wintering of sheep in yards. My impression is, that five sheep (six undoubtedly) make as much manure as one beast. I find sheep manure more quickly and more thoroughly rots, and becomes fit for the land. I have never tested their relative values side by side, but I have had no occasion to note any deficiency in the effects of sheep manure on any crop to which I have applied it." There is one other subject in connexion with the feeding of bullocks and sheep which is worthy our attention and our study. I refer to the quantity of food consumed by each animal respectively, and the quantity of flesh formed by the consumption of such food, or rather, the increase of weight attained. Mr. Lawes has favoured me with some particulars on this subject in a private communication, and has since published a great mass of valuable information upon the same subject, which appeared in the last volume of the Royal Agricultural Society's Journal. In his letter to me, Mr. Lawes says: "Fattening oxen fed liberally upon good food, composed of a moderate proportion of corn or cake, some hay or

straw-chaff, with roots, will consume 12 to 13lbs. of the dry substance of such mixed food per week for every 100lbs. of live weight, and will give 1lb. increase for every 12 to 13lbs. dry substance so consumed. Sheep so fattening will consume about 15lbs. of the dry substance of such mixed food per 100lbs. live weight, and will increase 1lb. live weight for about 9lbs. of the dry substance of this food." I need not comment upon this. The facts are clear and intelligible. It appears that the sheep consume rather more of this mixed food per 100lbs. live weight per week than the bullocks do, but that they give an increase of live weight in still greater proportion. I have now tried to look at the subject before us in its varied aspects. I have endeavoured to define the terms in which the subject was couched, and to explain the meaning I designed to attach to them. I have also given somewhat at length the details and particulars connected with my own experience, and have to these added the testimony of others. I now feel that I need say but little more. The facts that I have given remain to be affirmed or controverted, and the opinions I have expressed to be approved or disputed, and the arguments I have advanced to be shown to be logical syllogisms or fallacies. The decision upon all these points is in your hands, and I confidently leave it there, feeling assured that, in the discussion which shall follow, that candour and fairness which characterises your conduct at all times, will not in this instance be departed from. The question, how far sheep can supplant bullocks as manufacturers of manure? is important, and merits calm and deliberate attention. Of course, where no roots at all can be grown, the question of sheep in yards cannot be entertained. But upon farms resembling my own, where roots can be grown, but where the quality of all the natural food is inferior, and where the land is more healthy, and its produce more adapted for sheep than for bullocks, I cannot resist the conviction that sheep may be "advantageously substituted for bullocks in the manufacture of manure." And experience has convinced me that the three leading objections urged against the system to which I have adverted, and which I have endeavoured to show to be groundless, were *fears* rather than *experiences*. Some active imagination gave them birth, and fired them with all its own feverishness. They inspired terror for a while; and imagination pictured huge straw-stacks all over the farm, and hopping, pining sheep all over the yards, and failing crops all over the fields; and the necessary consequence of all—no effects in the bank. But they had no existence in fact. They could not bear the test of close reasoning and everyday experience. We conclude, then, as we began, retaining "Onward!" as our motto, and desiring still to "live and learn."

Mr. ROBERT SMITH (Emmett's Grange, South Molton) said, in his earlier days, he was very conversant with the management of sheep, and he wrote a paper on the results of his practice in one of the early numbers of the *Journal of the Royal Agricultural Society*. In that paper, which was published about the year 1848, he reported on some twenty experiments as to the amount of food which sheep would eat, the difference in the consumption of roots when artificial food was supplied, and the effect of warmth as regarded consumption in the yard upon straw, the open field-fold, and upon grass with sheds. He thought it might be well for some of them to refer to that paper, and examine the practical results there recorded. Mr. Ruston had given them two points of data: one related to the black moors of

Cambridgeshire, where that gentleman resided, which was familiar to him (Mr. Smith) as a Lincolnshire man. He knew that the black lands of that district had been changed from peaty matter into light black soil. In many parts of Cambridgeshire the soil had been consolidated by clayey matter dug from beneath; but he presumed that up to that moment Mr. Ruston had not used clayey matter on these soils.

Mr. RUSTON: Oh, yes!

Mr. SMITH said in that case he should have thought that the quality of the roots and of the straw and ryegrass would be superior to what it appeared to be from Mr. Ruston's description, and which inferiority was the foundation for the difficulties of his present position. This light soil required to be consolidated by the feet of sheep on the land, by folding or otherwise; thus it seemed to him better to consume ryegrass on the land than to mow it, the use of it in a yard created a difficulty which had to be met by an increase of the sheep in the yard. With regard to the profitable and comparative consumption of food by cattle and by sheep, Mr. Lawes had written most ably, and the last *Journal of the Royal Agricultural Society* contained the most valuable paper that had emanated from his pen. There was one important point on which Mr. Ruston had not given them the requisite information. He said that an acre of mangold carried 20 to 25 sheep; but he had not given them the weight of the mangold grown on that acre of land, neither had he laid before them the weight of the vegetable food that the sheep consumed. Perhaps, at a later period of the discussion, he would oblige them with some data on that point. With respect to sheep in the yard, he believed it would be found that warmth and cleanliness, to prevent lameness and scouring, had a great deal to do with the results. He would briefly give them his own experience with respect to that question. Some of his sheep were placed in open folds, some in sheds, some in yards some in confined houses; and in every instance the consumption of food was in proportion to the degree of warmth, exercise, and consequent respirations. It should be borne in mind that there was a standard heat in the animal frame, and that when that, and no more, was attained, all was right. As Lionel Playfair remarked, when you go either above the standard or below it, you get wrong. Warmth being equivalent to food, it was necessary that they should adhere as closely as possible to a certain degree of warmth in the animal frame. He (Mr. R. Smith) had found that when animals were exposed to cold, they would eat 25lbs. of turnips a-day, and that when they got into the yard, their consumption was only from 20lbs. to 22lbs., the average saving being 4lbs. or 5lbs. He had also found a material difference caused by giving animals artificial food. He thought it was wise economy even to give animals such food in the ploughed field; it not only improved the soil, but reduced the consumption of green food to such an extent that the artificial food paid for itself. Twenty experiments of that kind would be found recorded in the *Journal of the Royal Agricultural Society*, as having been made by himself and his shepherd, and he could vouch for the value of those experiments.

The CHAIRMAN enquired whether Mr. Smith could give them the comparative value of beast-feeding and sheep-feeding.

Mr. SMITH said he had not tested that.

Mr. J. COLEMAN (Park Farm, Woburn), said Mr. Ruston had told them that he had found sheep far preferable to bullocks. He agreed with him, for this reason—that sheep would produce a large amount of wool where bullocks produced nothing of corresponding value. But the question for heavy-land farmers to consider was whether sheep could be kept in yards in the same manner as cattle were now. On a large and extensive scale he had had little to do with the feeding of sheep in yards; but for the Baker-street, Birmingham, and summer shows, he had had something to do with a few fancy things; and it had always been a trouble to him to keep them in a proper state, even when feeding them as high as possible. In following Mr. Ruston's example, great care would be required to save sheep from foot-rot. If the sheep were driven out, and had a fresh layer of straw two or three times a day, they might be profitable; but would other farmers take the same pains in that respect that Mr. Ruston had? (Hear, hear.) If not, they must not expect to obtain the same return. He knew many men who bought cattle, turned them into a yard, and for months, perhaps, made no variation in the quantity of food or manner of feeding. That system would not do, if sheep were substituted for cattle. In his comparison between the paying properties of cattle and sheep, Mr. Ruston had presented the dark side of one question and the bright side of the other, putting an extraordinarily low price on cattle, and an extraordinarily high one on sheep. He had supposed that the fen farmers were in the habit of buying a very good description of oxen. But as he knew some of the men who were now feeding sheep instead of cattle, he was well aware of the class of animals they bought. When farmers in his district wanted to graze and feed cattle, they got the best they could; and if the fen farmers and others who kept store cattle would buy the veriest rubbish—he did not mean to say that Mr. Ruston did that (laughter)—how could they expect to be paid? If they purchased such cattle as were found in North Lincolnshire, at £12 to £13, those animals would pay well for wintering. He was glad that Mr. Ruston could make out that sheep paid. They all wanted, of course, to produce what would be most profitable to them. No doubt sheep would pay more for the same amount of food than cattle. Could they, as heavy-land farmers, keep a large quantity of sheep? Provided they took the same care and were as particular as Mr. Ruston, they could; and he thought no one would be so simple as not to try it, if he believed there was all this profit to be made. Mr. Ruston stated that roots produced on fen land were not in any degree fattening. He could scarcely agree with him. That his roots were not so fattening as those on the best lands in the neighbourhood of Boston, and those on the rich land of Mr. Heath in Norfolk, he would allow; but if his sheep could do well with the small amount of artificial food named, there must be more in his roots than he (Mr. R.) gave them credit for. It was a question whether by keeping store beasts and using more artificial food he would not obtain as great a profit as he had derived from sheep. He thanked Mr. Ruston most heartily for the able paper which he had read. No one could doubt that there must be some truth at the bottom of what he had laid before them; but if they expected to be as well paid for keeping sheep as Mr. Ruston had been, they would, he believed, be disappointed. He thought the general tendency among farmers now-a-days

was to keep as many sheep as they could, and to consume with them as much as possible of root and straw crops.

Mr. FISHER HOBBS said, as an Essex farmer, he could bear testimony to the great value of the paper read by Mr. Ruston. The question was not of that limited and restricted character which that gentleman implied at the commencement of his remarks, but it was one of great importance at the present time. With regard to farmers generally, it might be said that during the last two or three years the grazing of cattle had not been very profitable. The Duke of Bedford's farm steward spoke of wool in connection with sheep. That article, it should be remembered, was every year becoming of greater value and importance to the manufacturing interests of this country. He (Mr. Hobbs) had had considerable experience in the yarding of sheep for a long period. During his early days he saw that system carried out by the late Lord Western with a breed of sheep, which, owing to the character of their feet, were less qualified to bear the manure than many other breeds of sheep. This led him to observe that there was one material point in the management of sheep in fold-yards, which was not generally understood by the farmers of this country—it was that sheep should be littered, and thinly littered, at least twice a-day. Attending to that, and never allowing manure to ferment, he had not found any difficulty in keeping sheep in yards. There was one important point on which Mr. Ruston did not touch. Many persons who put sheep in yards turned them into yards where the sheds were very wide, and more fit for beasts than for sheep; the consequence being that the manure heated, and the sheep were in great danger of becoming lame. He thought the yarding of sheep, with the allotment of four square yards to each sheep would enable farmers to keep double the quantity of sheep, and to employ double the capital for the consumption of roots, that they now did on many heavy land farms. In the county of Essex the losses of farmers amongst their cattle from pleuro-pneumonia had been very heavy. He would concede to Mr. Coleman that this might be attributable in some degree to their not selecting the best animals; but the farmers in his part of England had not the same opportunity of going into the breeding counties, and selecting animals from the large grazing districts. By the time cattle from the breeding districts arrived in Essex, Kent, and Sussex, they had been driven from fair to fair—they had been heated by travelling on railways, and they had those seeds of disease sown in them which occasioned frequently a great loss to the farmer. He hoped the subject would be extensively discussed that evening. He believed that if sheep were substituted for beasts to a considerable extent in the heavy-land districts, provided particular attention was paid to the littering yards, and to the trimming and dressing of the feet when disease showed itself, the result would be satisfactory. But the question did not stop there. There were many poor parts of the country, such, for example, as the chalk hills of Surrey, where cattle could not be advantageously grazed in summer, and where sheep would be most advantageously fed in fields and yards in winter. He thought that in the grazing districts, where no cattle could be advantageously grazed in summer (he spoke especially of his own county, where they had but little grass land of much value for grazing), farmers would be glad to substitute sheep for beasts, if it could be proved satisfactorily that sheep would convert

straw into manure as profitably as beasts did. He was satisfied that for the last few years sheep had paid far better than beasts.

Mr. BRADSHAW (Knole, Guildford) said, the subject as it was introduced that evening, was in a great measure confined to a particular locality—that of Cambridgeshire. As regarded the house feeding of sheep, the observations of Mr. Ruston were very valuable. He could corroborate them to a great extent by what he himself saw, in the year 1858, in the neighbourhood of Versailles, where 700 sheep were kept under cover in two separate buildings, and did not exhibit any signs of rot or lameness—a fact which he attributed entirely to the way in which they were bedded. As to the relative value of sheep and bullocks, every man must consider his own locality. For example, what might be very good in Lincolnshire, might not be so in the neighbourhood where he (Mr. Bradshaw) resided. He considered that the best and most profitable system was that of a division between sheep and bullocks. For the present season, the scarcity of roots had forced upon them great economy in the use of that material, and they would probably in after-years effect a diminution of the expense of carting roots from the land. He had in store 20 bullocks, and giving them 16 bushels of turnips per day, he found them thrive better on that quantity, than they did when he gave them twice as much; they did not consume 1lb. more chaff than they did when he gave them a considerable additional quantity of turnips. They had also 12lbs. of straw and 9lbs. of hay; and he found that he could not get any more into them (laughter). Talk of bullocks not paying! That depended on the way in which they managed them. If they bought a bullock in the month of October, and put him up at £15 or £16, it would not pay; every practical man knows that. He had bought them at that price.

Mr. COLEMAN: Do you mean for feeding, or to keep in store?

Mr. BRADSHAW: For feeding and selling them off six months afterwards. If they bought them young, and reared them on the farm, they had to put their hand lightly in their pockets, and keep them till they were two years and six months, or three years old, which was his own practice, they would pay. Although he put them up in October, he never began till the 1st of January to give them concentrated food—oilcake, barley, or whatever he might choose to supply them with. He gave them 3lbs. of cake per day for the first month, 4lbs. for the second month, and 5lbs. for the third month; never exceeding 5lbs. per day. His first beasts, which commenced with cake on the 1st of January, would go off the next day (April 2nd). As regarded sheep, he considered that sheep bred and reared upon the farm, and fattened upon it throughout, would yield as good a result as they had heard of that evening. Perhaps the result was about equal to that in the case of bullocks; but it should be recollected that with sheep they got a great deal of valuable manure consumed on the land which left its marks, while by the consumption of their other food by bullocks they obtained a large quantity of manure which was valuable for other crops.

Mr. JAMES THOMAS (Dibden, Hants) said: As regarded the question whether sheep might as manufacturers of manure be made superior to bullocks, there could be no doubt that on all good sheep farms, where the land would allow of turnips being fed upon it, the cheapest mode of manuring was by consuming the crop there. The practice of Hampshire, and of the greater part of Wiltshire, was to carry the litter on the

land and plough it in; and this ensured a rich crop the next year. Mr. Ruston spoke of land where you could not feed. The question was, how best to employ roots? When £100 was laid out on artificial food, sheep would, with the wool, pay better than bullocks; but it was a question whether manure from sheep alone would be as efficacious in raising cereal crops as if it were mixed with ox-dung. He had little doubt that sheep-dung was as good as the other, but there were difficulties in the way of applying it. He thought Mr. Ruston had exaggerated the difficulty of making cattle pay. It was essential to success that the grazier should have judgment equal to the picking out of the oxen which would improve most on a given quantity of food. There were thousands and tens of thousands sold in the fairs of England which no skill on the part of the agriculturist or grazier could turn into meat. For want of judgment many farmers bought cattle of that kind, and when they wanted to sell them in the spring there was a loss instead of a profit. Having fed many hundreds of sheep in yards, he would remark that, in order that sheep fed in yards might be kept in perfect health, and their feet preserved from rot, the yard should be thoroughly underdrained, so that no moisture would remain under the animal. On one farm in Hertfordshire the sheep had fattened entirely on boards. They did not undergo the agony that oxen did when lying on boards. In this case the boards were perforated with holes, which allowed all the moisture to pass through; and he had found sheep under such circumstances enjoying themselves as much as if they were lying on straw or in their folds. Sheep would thrive better in that way than in any other; but the straw would not be converted into dung. Would it not be better to keep them under cover and give them artificial food, while you made straw into dung through the action of the bullocks? In reference to the remarks of Mr. Bradshaw, he would observe that a 100-stone bullock (8lbs. to the stone) in good heart would eat 100lbs. of turnips per day, a 90-stone bullock 90lbs., and an 80-stone bullock 80lbs. Having tried that food in larger and smaller amounts, he had found that that was the quantity which beasts consumed to the greatest advantage. He could not agree that it would be judicious for mangold wurzel, straw, or oilcake to be consumed entirely by sheep: he thought the conjunction of the two would prove most profitable to the farmer and to the public (Hear, hear). With regard to the extraordinary difference between the qualities of roots grown on different soils and in different localities he would remark that a hundredweight of turnips grown on some very fine sheep land were not equal to half a hundredweight grown on heavier soil. In Aberdeenshire, Fifeshire, and other eastern counties of Scotland, where animals were fed with turnips and hay alone, bullocks were sent forth of better quality than bullocks from Norfolk which had been fed on hay, straw, and oilcake.

Mr. J. F. SABERTON (Doddington, Cambridge) said he was led to rise by the remark of Mr. Coleman, to the effect that the fen farmers were not skilful in selecting bullocks. That might be the fact: In the fens they were not breeders of bullocks. They bought calves from Woburn, and that side of Buckinghamshire; and if Mr. Coleman visited them, he would find as fine cattle and as good judges as he would meet with anywhere else. He wished some gentleman had made a hearty attempt to refute the details of Mr. Ruston. Having made some inquiries in their neighbourhood, he felt bound to confirm what that gentleman had said. He knew several gentlemen farming 800 or 1,000 acres, who, having been graziers and fatteners of bullocks for many years, had latterly directed

their attention to sheep, and each and all of them were increasing their quantity year by year. Mr. Nix was one of them; and another farmer whom he knew had tried the wintering of his ewes entirely in yards, and completed his fold with fewer losses than he ever sustained before. Mr. Thomas's remarks were applicable solely to clay land, and the quality of the mangolds there. That was totally different from the case of black peat. He believed that Mr. Thomas's conclusion was that it would be foolish to go either for beasts or sheep alone. In that they all concurred. Concerning the opinion of Mr. Lawes, as to the quality of the manure being equal, I should demur, as it appears a logical inference, if *more* market value is extracted from the same amount of food consumed by sheep than beasts, just so much less reproductive elements are contained in the sheep manure. In his opinion it was desirable that the occupiers of clay soils should give a fair trial both to bullock and sheep, and state the result next year.

Mr. COUSSMAKER (Westwood, Guildford) said this was the most practical subject that had been discussed for a long time, and he thought it the duty of every member to give the result of his own experience. The Summer before last he had the misfortune to lose about two-thirds of his cattle. He had a lot of food which he did not know how to consume, and fearing that the yards were infected, he durst not buy any more cattle, and he came to a determination to buy sheep, and winter them in the yards. His yards were well drained. He gave instructions for the scattering of straw over the yard once or twice a day; and notwithstanding that that was carefully done, his sheep suffered very much from foot-rot. He left them in the yard till the weather became dry, and then fattened them off in the field; but a great many went to the market very lame. The lung disease was so prevalent in the neighbourhood during the whole summer that he was afraid to replenish his stock, and he had no more now than he had last year. This year he had introduced what cattle he had into the yards, and as he had many tons of mangold wurzel and hay laying by, he had given orders for sheep. He was now going to consume hay and mangold on the land: he was afraid to do so in the yards, after what he suffered from the rot last year.

Mr. HOBBS: What becomes of the straw?

Mr. COUSSMAKER: It is not manufactured as much as it ought to be.

Mr. JOHN THOMAS (Bletsoe, Beds) thought that in matters of that kind the fairest test would be to buy the sheep in, and sell them off at a fair market price. Mr. Ruston said he valued them in at a certain amount, and sold them at a certain profit. He did not dispute the correctness of the calculations; but still he repeated that the fairest test of value was the market price at which the sheep were bought in and sold out. The conclusion to which his experience of the feeding of bullocks and sheep had led him was, that it was best to have a portion of each description of stock. Yards were unnatural places for sheep; in his opinion it would be better to provide a moderate shelter of hurdles fitted up with straw; and, therefore, he would consume the roots in the field, and obviate the expense of bringing them home. As regarded both bullocks and sheep, very much depended on the judgment of the farmer in buying in and selling out. When he had gone to market and bought a good bullock at a moderate price, he had seldom failed to make a profit. After his bullocks had been fattened they always left a large quantity of manure. As a farmer of many years' standing, he must say that he had certainly found sheep pay better than bullocks, where the land is adapted to that description of stock. The best course, in

his opinion, was to draw a portion of the roots to the yard for bullocks, and leave another portion for sheep.

Mr. HOBBS explained. In advocating the yarding of sheep he had not done so in the light in which many members appeared to suppose. As he understood Mr. Ruston, that gentleman did not mean that sheep should be brought into the farmery, and placed within stone walls and sheds, but that they should be brought into fold-yards and be placed on straw on that portion of the farm where they could make manure most advantageously. That was the way in which he understood him to recommend the yarding of sheep. He knew that that was advantageously done in many parts of England. The roots were conveyed to that portion of the farm where the straw was; they were consumed there by the sheep in open yards, with hurdles round them, and some corn or straw stacks in the immediate vicinity.

Mr. J. THOMAS: They would be folds.

Mr. HOBBS: Yes. He considered that sheep might convert straw into manure very advantageously in yards or folds, or whatever they liked to term them. It was not a matter of necessity that sheep should be under cover. Whether they were fed and fattened in yards or in folds, it was better that they should lie out in the open, than in sheds among manure in a state of fermentation.

Mr. RUSTON, in replying, said Mr. Robert Smith had intimated that on the peaty moory soils of Cambridgeshire they had not arrived at such a state of farming as to put clay on the land. For a great number of years clay was as common in the Fens as travelling on the highway, and found employment for a great number of surplus labourers in the winter months. If Mr. Smith would come and pay him a visit, he would show him how they managed the clay in the Fens; and he would show him eight horses dragging a plough through peat land, dragging up some of the clay, and forming a new soil to the depth of eighteen inches. The system was extending very much in the Fens, and many persons ploughed to the depth he had mentioned. He had ploughed twenty-six inches deep with twelve horses. Mr. Smith further remarked that if they had used clay their ryegrass would have been of better quality.

Mr. R. SMITH concluded that if the quality of the food consumed were so bad, the farmers could not have clayed the land.

Mr. RUSTON continued: He was sorry to say that what he grew, though sufficient in quantity, did not do much towards fattening animals. On this point he consulted Mr. Sowerby, of North Lincolnshire, who was of the same opinion. That gentleman could feed bullocks on 4 lbs. or 6 lbs. less cake per day than he (Mr. Ruston) could. Their land, however highly they might farm it, would not produce food of good feeding qualities. Mr. Coleman said he did not consider the system adapted to heavy-land farms. The testimony of Mr. Delf, of Essex, showed that practically the system worked well there. He also remarked that unless others took the same trouble as himself (Mr. Ruston), they would not be successful, adding, in effect, that they would not drive their sheep out two or three times a day. He did not say that he (Mr. R.) had done that, but he quoted Mr. Martin, who did drive them out once a day last year, but who had this year, as previously observed, omitted the practice, it being unnecessary. Mr. Fryer also stated that one year he drove them out once a day, and found it occasioned lameness, and had consequently discontinued the practice. Mr. Delf only drove them in and out for the first fortnight. He (Mr. Ruston) had never driven them out at all. He had littered twice a day in showery weather, putting a thin dry layer over the wet one.

Mr. J. THOMAS: What description of yard is it?

Mr. RUSTON: Not a very close yard; Mr. Delf used five-foot hurdles, and took the sheep where mangold was grown. Mr. Martin sometimes pursued the same course; he stacked his corn at a distance from the farmyard, grew his mangold near, and sent his sheep there. He himself had used the most ordinary fold-yards; they were not close, and the sheep had not suffered from being too much confined. With respect to Mr. Coleman's remark about buying bad cattle, he begged to say that he was in the habit of purchasing Scots, or going to Caistor (he was no stranger at Caistor), and not of buying three-cornered cattle (laughter). A few years ago he weaned calves, and for two years had all the bull calves Mr. Chickley (a neighbour of Mr. Coleman's) bred, many of which he believed were by Sir Charles Knightley's pedigree bulls. If they bought such bad bullocks that they could not obtain a profit, it was marvellous that they should buy sheep which always yielded a good profit. Great importance ought to be attached to the remarks of Mr. Hobbs, as to littering sheep twice a day and paring their feet. He made a point of setting his shepherd to examine the animals' feet occasionally. In the first winter, out of 370 sheep, not more than 12 were lame; this year he had more, but had had 20 lame in the fields before they came in to one now. Mr. Sowerby told him, when looking over his sheep last week, that in his (Mr. S.'s) turnip-folds in North Lincolnshire he had three lame sheep to one of his (Mr. R.'s) in the yard. He confidently asserted that with proper management lameness might be almost entirely avoided in this part of the country. What was said by Mr. Bradshaw with regard to the 700 sheep at Versailles, showed that sheep might be kept in yards without lameness. As to locality, no doubt that must influence their arrangements. He did not say that his system was right everywhere, but it was right for him, and for all persons similarly situated. Every man must judge for himself as to what was best for his own land. Mr. James Thomas doubted as to the quality of the dung, but what he had seen convinced him (Mr. Ruston) that the dung of sheep was equal to that of bullocks. The same gentleman thought he had exaggerated the difficulty of making bullocks pay. He did not rely on his own judgment exclusively, but consulted several gentlemen who kept bullocks in yards. He took a good class of animals, 30s. being the amount received for natural food for a growing bullock; and Mr. Saberton would bear him out in saying that 30s. was a good profit.

Mr. SABERTON: Yes.

Mr. RUSTON: He knew a case in which a gentleman, a relative of his own, bought 20 bullocks, not those three-cornered bullocks (laughter), at £15 each in the autumn of 1859. Many of these had been purchased as calves, he believed, at nearly 50s. per head, of Mr. Robert King, of St. Neots, and had been bred in the beautiful Vale of Aylesbury.

A MEMBER: What age?

Mr. RUSTON: About three years. They were resold the last Friday in April 1860 at £20, leaving £5 per head for wintering. They cost £4 each for cake, in addition to which the 20 consumed 10 acres of hay and 7 acres of mangels, and to this must be added the charge for attendance. The same gentleman had got 20 more this year, which were not likely to yield a better return.* Mr. Hobbs had intimated that wool from sheep kept in yards was superior to wool from sheep kept in the open field. He (Mr. Ruston) had no doubt that that was the case. Mr. James Thomas referred to the quality of the roots on the east coast of Scotland. That was an illus-

tration of what he read. Here a large quantity of cake was required to fatten a bullock. In Lincolnshire, a smaller quantity of cake was required; in Yorkshire a still less quantity, and in Scotland even less still. As they went further north, the quality of the roots was better adapted for bullocks. He regretted that Mr. Cousmaker had suffered so much from foot-rot; but he could not help thinking that there must have been some mismanagement, as there was general testimony to the avoidability of that evil. Mr. Thomas, of Bletsoe, thought there would have been a better test of the value of his sheep had they been bought for the yards, and sold out. No doubt that would have been the case; but when he bought his sheep, it was not at all with a view of reading a paper on the subject. He bought lambs in the ordinary way of business. It was an experiment, his object being to see whether he could winter sheep in yards satisfactorily. He valued them in and out, calling in a competent man to assist him in the valuation. He was not prepared to sell the animals out, as he wanted them for his summer grass; but he thought such valuations must be satisfactory to all men of business. As regarded the manufacture of manure on the Fen lands, he would remark that where they did not use bullocks many used pigs. Pigs paid better than bullocks, but sheep paid better than pigs. Formerly he used to keep 21 breeding sows: he had reduced them last year to 13, and was now reducing them to eight, because sheep paid so well. In conclusion, he would observe that his paper related to land where turnips could not be grown, and where the quality of the natural food was not fattening.

On the motion of Mr. LITTLE, seconded by Mr. JOHN THOMAS, a vote of thanks was accorded to Mr. Ruston for his introductory paper.

The proceedings terminated with the customary acknowledgment to the Chairman.

THE INDEPENDENT FARMER.

Let sailors sing of the windy deep,
Let soldiers praise their armour,
But in my heart this toast I'll keep,
The Independent Farmer,
When first the rose in robe of green
Unfolds its crimson lining,
And 'round his cottage porch is seen
The honeysuckle twining;
When banks of bloom their sweetness yield,
To bees that gather honey,
He drives his team across the field,
Where skies are soft and balmy.
The blackbird clucks behind the plough,
The quail pipes loud and clearly,
Yon orchard hides behind its bough
The home he loves so dearly;
The grey old barn, whose doors unfold
His ample store in measure,
More rich than heaps of hoarded gold,
A precious, blessed treasure;
But yonder in the porch there stands
His wife, the lovely charmer,
The sweetest rose on all his lands—
The Independent Farmer.
To him the Spring comes dancingly,
To him the Summer blushes,
The Autumn smiles with mellow ray;
He sleeps, old Winter hushes,
He cares not how the world may move,
No doubts nor fears confound him;
His little flocks are linked in love,
And household angels round him;
He trusts in God and loves his wife,
Nor griefs nor ills may harm her;
He's nature's nobleman in life—
The Independent Farmer.

* Mr. Ruston also gave another case in which a farmer was giving his straw and mangolds to another person on condition that he would send him bullocks to make his manure, and would give them 8lbs. linseed cake each per day.

ON DRAINING.

BY JOHN EWART,

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The object of the present paper is to point out hydraulic principles necessary to be understood, and to give rules for calculating results required to be arrived at in the efficient draining of land. Such principles and calculations are frequently neglected to be carried into practice by those who undertake so important an element of agricultural improvement, and which neglect has almost invariably resulted either in inefficiency or in needless expense being incurred.

To demonstrate the rules to be met with in the present article would obviously trespass too much on the pages of a periodical publication on which there must always be considerable demand on its space for matter of varied topics, therefore such demonstrations are omitted; besides which, the rules in question are mostly of so simple a nature as to be easily investigated by those readers who may have any knowledge of mathematics; and to those who may be wholly ignorant of the science, demonstrations would not only be uninteresting, but wholly useless.

For the first of the above-mentioned reasons tables of the results of the calculations have been omitted, and also because the rules themselves are, for the most part, so concise that the labour in making calculations in any case that may arise will be found to be inconsiderable. The tables referred to in the rules being found in most books treating of elementary mathematics, it will be unnecessary to reprint them, even if such matter were suitable for these pages.

Having in the foregoing preface explained the reasons for omission of matter, which to many readers may appear to be important, the subject of the present article may be proceeded with.

Land draining may be classed under three distinct systems.

The first is that called *Trunk Draining*, and consists in the improvement of estuaries and tidal rivers in the discharge of their waters into the sea; the increased discharge of the waters of streams and rivers beyond the action of the tide; and the formation of open cuts to receive the water collected by covered drains, and to discharge it into natural watercourses and streams.

The second system consists of the removal of underground water by the tapping of land springs.

The third system is that known in different localities as *frequent draining*, from the frequent occurrence of the drains in the soil; *thorough draining*, from its intended effect; *furrow draining*, from the trenches being in many cases made in the furrows of the lands; and *parallel draining*, from the drains collecting the water in the soil being laid out parallel to each other.

Before entering on the consideration of the different systems of draining enumerated above, it may, perhaps,

render subsequent remarks more perspicuous to glance at the physical properties of water so far as they affect the subject under discussion.

Were it not for its fluidity, water would, as regards its motion, be subject to the same laws as solid bodies; but, on account of this property, the laws by which the motion of solids are regulated require great modification when applied to water.

Fluidity is that property of a body, whose parts are very minute, by which the yield to any force impressed upon it, however small, and by so doing are easily moved among themselves; and therefore the body is incapable of assuming any definite form.

A property of water is, that it is nearly wholly *incompressible*, so much so, that for all practical purposes it may be considered perfectly incompressible.

All fluids have not the same degree of fluidity, according to the facility with which their particles may be moved amongst each other. Water and mercury may be classed amongst the perfect fluids. Many others, such as oil, mucilage, and such like, have a considerable degree of tenacity, are therefore imperfect fluids, and that property known by the term *viscous*.

A cubic foot of distilled water weighs at ordinary temperature of the atmosphere of Great Britain 1,000 ounces or 62½ lbs. avoirdupois; and rain or spring water in its usual state of purity may be taken at the same weight; consequently there are 35.84 cubic feet to weigh one ton.

A column of water 1 inch square of horizontal section weighs 0.434 pound avoirdupois for every foot of its height.

A cubic foot contains 6.23 imperial gallons, and a cylindrical foot 4.9 imperial gallons.

When the atmosphere presses on the surface of the earth with a force of 15 pounds to the square inch, it balances a column of mercury of nearly 30 inches, or a column of water 34.56 feet in height.

The quantity of water in one inch in depth of rain fall on an imperial acre of surface is 3630 cubic feet, which is 22622.523 imperial gallons, or 101.28 tons. Water solidified in the state of snow in the climate of Great Britain is increased to six times its bulk, or six inches depth of snow fall is equivalent to only one inch depth of rain fall.

Water, when contained in a vessel, presses against the sides of the same equally with a pressure of one-half that with which it presses the bottom, such pressure being distributed over the whole surface of the sides; while the lateral pressure on the bottom of the sides of the vessel is equal to the perpendicular pressure on the bottom.

The point of pressure, or that point in which the

whole pressure is concentrated, of water against a perpendicular dam is at one-third of the height from the bottom.

Water at the temperature a little above the freezing point expands, and this with so much force as to burst the strongest pipes, or the toughest and hardest rocks, if so confined as to offer resistance to the expansion. The fact of the expansion of water in freezing is obvious from the fact that ice always floats and sustains a considerable burthen upon water.

Water has a constant tendency to descend; but the instant it meets with resistance it exerts its force in every other direction.

The above-mentioned force in water is invariably exerted until it has found a level, and it can then only be said to be at rest; and it will, therefore, continue to rise from a lower to a higher level until the two surfaces at each end in a bent tube are at the same height; and so in a porous stratum filled or covered by an impermeable one; and whenever this equilibrium is attained it remains in that state until disturbed.

Water ascends through the soil by capillary attraction, wherever the lower portion of the soil rests in water.

Such, then, being the properties of water, at least so far as they relate to the subject under consideration, the different systems of draining previously enumerated may be discussed.

TRUNK DRAINING frequently involves works of considerable magnitude and complication, which will require the professional assistance of an engineer, whose attention has been directed to hydraulic phenomena, in designing them, and under whose direction and inspection the works will require to be carried on by contractors accustomed to execute such operations.

Although very extensive works in the kind of draining now referred to may require the direction of the professional engineer, yet it will seldom occur that land draining will not require recourse being had to the formation and improvement of open water-course on a minor scale, and within the competence of an intelligent farm overseer to direct the execution, in which there are certain maxims, as regards the motion and effluence of water, necessary to be observed with a view to efficient drainage, which are seldom attended to in the designing and laying out of such works by unprofessional persons.

The following are the results of observations by an eminent engineer of the past age—Smeaton: "That, mathematically speaking, if a river runs upon a bottom lying with an equal descent, the velocity of the water will be the greater the further it runs. Thus, supposing the descent to be one foot per mile, the water will have acquired a velocity of eight feet per second. After four miles, its velocity would be sixteen feet per second; and, at the end of six miles, it would be at the rate of thirty-two feet per second; its velocity at every point being the same as would be acquired by a body falling the same perpendicular height.

"These rules, with respect to the motions of rivers, are very far from being observed, on account of the perpetual obstruction that the water meets with against the sides and bottom, which counteract the power of

gravity, and reduce the water to a uniform motion where the declivity of the bottom and sides are regular.

"That, supposing a given quantity of water to be carried off, the smaller the descent, the width and depth or section of the river must be greater; for the water, running in a larger body, and slower, meets with a less proportionable obstruction from the sides and bottom.

"That also, supposing the same quantity to be discharged, the larger the body it runs in, and the slower the motion, the more liable its course is to be obstructed by mud, weeds, &c., &c.

"That large and deep rivers run sufficiently swift, and discharge vast quantities of water, with a descent of one foot per mile.

"That small rivers and large burns require about two feet per mile.

"That small burns hardly keep an open course under four feet per mile.

"That ditches, covered drains, &c., require at least eight feet per mile.

"That when a tract of ground lies level, it is much preferable (where it can be done) to lay the drain deep at one extremity, to give a greater descent upon the bottom all the way, than to make a broad and less deep drain all the way upon a less descent, for the former method is attended with less extent of digging, and better calculated to keep an open course."

Although the descents mentioned above are the least required, under the several circumstances, for water to have a sufficient velocity to keep a clear course, yet the velocity of the current must be adjusted in *equilibrium* with the tenacity of the channel. In respect to the latter condition in the adjustment of the velocity of water-courses, it has been determined by Du Buat and others, that the following velocities per second at bottom will move—

	Velocity in inches.
Clay	3
Fine sand.	6
Coarse sand	8
Water-worn gravel an inch in diameter.	12
Angular stones the size of a hen's egg.	36

In open water-courses the velocity is greatest at the surface, and in the middle of the stream, from which it diminishes towards the bottom and sides, where it is least.

The velocity at the surface of a stream is easily determined by the distance a floating body is carried in a given time, from which the velocity at the bottom may be found by subtracting 1 from the square-root of the velocity at the surface, and the square of the remainder is the velocity at the bottom. The mean velocity is half the sum of the velocities at the surface and the bottom.

An element in calculating the velocity of water-courses is what is called, by some writers on hydraulics, the *hydraulic depth*, and by others the *radius of the section*. It is the quotient arising from the area of the section being divided by the bounding perimeter of the channel. Thus, in a semi-circular channel it is the area of the semi-circle divided by the semi-circumference of the whole circle; or, in case of a water-course being a figure bounded by straight lines, it is the quotient of

the area of such figure being divided by the sum of the sides and bottom.

The slopes for the sides of open water-courses, when not supported by walls of masonry, or by piling, should never be less than the natural angle of repose at which the earth in which they are made will stand, and which may be stated to be as follows, viz :

Clay or strong earth..	..	..	45.0 degrees
Dry sand ..	..	..	40.0 "
Sand less dry ..	..	..	39.6 "
Common mould ..	..	..	37.0 "
Wet gravel ..	..	..	35.0 to 36.0 "

But in most cases the sides should have much more slope than stated in the table above; and abrupt bends or changes of direction should be avoided as much as possible, as such deviations from a straight direction not only retards the velocity of the current, but renders the sides and bottom of the water-course liable to be destroyed by the eddies in the angles of the bends.

The most perfect form for the section of a watercourse is a semi-circle, as in such the greatest body of water is enclosed by the smallest bounding surface; and, therefore, the surface offers the least resistance by friction to the velocity of the stream. But such form would necessitate the watercourse being lined with masonry, and, on account of the expense, can only be applied to watercourses of very small size, and where it is important to assist the motion of the water to the greatest extent under circumstances of small declivities. For channels bounded by straight lines the best form is for the sides and bottom being tangents of a circle, of which the radius is equal to the depth of the channel or course, as such form, under the circumstances, offers the least resistance to the motion of the water, and consequently gives the greatest degree of permanence to the sides and bottom. Under circumstances in which the expense may not be an object, and either a very great declivity rendering the bottom liable to destruction by the action of too rapid a current, or too small a declivity rendering every aid to the motion of water important, the section of the bottom may be an inverted arch of a segment of a circle to which the sides are tangents. Such arch will be best formed of glazed earthenware segments, which, for lightness, may be hollow, and made with the drain-tile machine, now in general use, at a very moderate cost. The number of segments to form the inverted arch may be any uneven number that the size of the channel, the extent of it to be protected, and avoidance of too great weight of the segments for being conveniently handled may render necessary. Whatever may be the number of such segments that may be required, their sweep should be with a radius of a circle equal to the depth of watercourse. The following diagram is that of a section of a watercourse having the bottom protected by an inverted arch formed of the glazed earthenware segments recommended and described, and the sides lined with brickwork, in which the first course above the arch are bricks on bed laid as headers, the second course are stretchers, and the subsequent courses bricks on edge as stretchers, with every sixth brick a header. Where such a lining may be required to be carried to a con-

siderable height, then at every eighth or tenth course the first two courses described above may be repeated; and for any height the last two courses of the brickwork should be the same as the first two reversed, i. e., the course of stretchers should be under, instead of above, the course of headers of bricks laid on bed.



The length of the sloping side of a watercourse forming a tangent to the circular arc of the inverted arch of the bottom is found by the following rule, viz., to twice the depth multiplied by the difference between half the breadth at top and the depth, add the square of the difference between half the breadth at top and the depth, and the square root of the sum is the length of the side required.

To find the length of the circular arc forming the inverted arch of the bottom of a watercourse, divide the depth by half the breadth at top, and the quotient is the natural sine of the angle of the slope of the side with the horizon, which is also half the angle subtended by the arc forming the inverted arch, the number of degrees and decimals of a degree of which multiplied by .01745, which is the length of one degree of a circle of which the radius is unity, and the product of which again multiplied by the depth gives the length of the arc required.

A concise, and at the same time sufficiently accurate rule for practical purposes, to find the velocity of water running in open courses of given dimensions and declivity, is to multiply the hydraulic depth or radius of the section by the declivity per mile, both in feet, and extract the square root of the product, and the result multiplied by 82½ gives the velocity in feet per minute, and which result divided by 5 gives the velocity in inches per second.

The last rule only applies strictly to a straight course. When there are bends, a correction of the result of the formula is required for the effect of friction or obstruction caused by the bends; which correction consists in reducing the actual height by a head or height that will overcome the obstruction spoken of, and which may be found as follows, viz.: divide the continued product of the square of the velocity in inches per second as found by the last previous rule, the square of the natural sines of the angles of the bends or deviations from a straightforward direction, and .0003 by the square root of the hydraulic depth in feet, and the quotient is the required correction in inches. It will then be necessary to repeat the operation of finding the velocity from the given declivity reduced by the correction. It should, however, be remarked that, unless the declivity is very considerable, or the bends numerous or very abrupt, the decrease of velocity from deviations from a straight-

forward direction of a watercourse is scarcely appreciable in practice.

If a watercourse have the sides and bottom tangents to the semi-circle, of which the radius is the depth, and of which form, it should be remarked, all watercourses, the section of which is bounded by straight line, ought to be, the breadth of the top will invariably be double the length of the side.

Having ascertained the velocity of current of a water-course by the rule previously given, the discharge in cubic feet is found by multiplying the velocity in feet per minute or second by the area of the section in square feet; which result, multiplied by 6·23, gives imperial gallons, or, divided by 35·84, gives tons weight of water. The area of section of water-courses is easily found by the rules given in books treating of mensuration. The most concise mode of finding the area of circular segments is to divide the versed sine of the arc of the segment by its diameter, and the number corresponding to the quotient in a table of the areas of segments of circles, of which the diameter is 1, and which is to be found in every treatise on mensuration, multiplied by the square of the diameter of the arch, or twice the depth of the water-course, is the area of the segment of which the bottom or channel of a water-course is an inverted circular arch. Such segmental area must be added to the area of the trapezoid bounded by the breadth at top, the sides, and the chord of the inverted arch of the bottom, for the area of the section of the water-course. Tables of the natural sines of every degree and minute of a degree of a quadrant of a circle are to be found in every treatise on trigonometry.

The number of stock bricks laid dry, according to the kind of work specified, in each course of a chain in length, in lining water-courses, will be as follows, viz. :

Flat as headers, height of each course $2\frac{1}{2}$ inches ..	187
" as stretchers, height of each course $2\frac{1}{2}$ inches ..	91
" as stretchers, with every sixth brick a header, height of each course $2\frac{1}{2}$ inches ..	103
On edge as stretchers, with every sixth brick a header, height of each course $4\frac{1}{2}$ inches ..	103
Hollow bricks for inverted arch bottom, length of each $1\frac{1}{2}$ foot ..	44

The weight of stock bricks of the usual size is about 45 cwt. per thousand.

The system of draining next in order for consideration is the DEEP, or more generally known as the ELKINGTON SYSTEM, from Joseph Elkington, a farmer at Stretton-upon-Dunsmore, in Warwickshire, by whom it was discovered in 1764, and by whom, and also by a person named Smith, who, for that period, possessed great geological knowledge, it was afterwards practised with great success. So important were the discovery and practice of these men deemed to be towards the close of the last century, that Elkington was rewarded with a premium of £1,000 of public money, voted by parliament in 1795; and Smith was honoured by having the degree of D.C.L. conferred upon him by the University of Oxford.

The system of draining in question is mostly, if not entirely, for the purpose of draining springs, which, until comparatively of late years, was considered to be the sole cause of injurious wetness to the land. Before

proceeding to describe the way in which Elkington's system of draining was, and is as yet in some cases, carried out, it may be well to offer some remarks on the nature of springs.

The proximate source of all springs is the absorption of rain water and condensed meteorological vapours by the soil, from which these pass into pervious strata of the earth, in which the water accumulates, and follows the dip until such strata appear at or near the surface, over which the water flows until it finds another stratum of a pervious nature, or is received into some other channel by which it can pass—in the latter-mentioned case furnishing the supply, first of insignificant burns; then by several such combining their contributions, and forming rivulets; and again, these combining, furnish the supplies of large streams and rivers, by which the water of springs is at last discharged into the ocean, the evaporation from which is the original source of all water in the land. Springs are frequently supplied from a widely extended district of surface; and it is, therefore, not a necessary condition of their waters appearing at the surface, that the strata in which they are contained should actually crop out to the day, as it is frequently the case that large springs by their pressure break through rocks, banks of clay of considerable thickness, and other impediments which oppose their progress along the strata in which they are contained.

There are two kinds of springs—*permanent* or *true springs*, and *temporary springs*. The true springs furnish a constant supply of water at all seasons, whilst the temporary springs either exist only during wet weather, and are, in such cases, always at a higher level than true springs; or they are occasioned by the leakage of true springs, when they appear at a lower level than the main springs from which they proceed. This is the reason why in sloping ground a true spring is never found either at the top or bottom of a slope; and that temporary springs generally appear near the top or bottom of rising ground. It should be remarked, that temporary springs may be found both at the top and bottom of slopes. A temporary spring at a lower level than a true spring is occasioned by a slip of the stratum containing the main spring; whilst a temporary spring above the level of a main spring is merely the outburst of water prevented, by some local impediment, from passing from the absorbing surface to a pervious substratum.

The interception of outbursts of temporary springs is never successful in effecting the complete draining of land by the deep Elkington system. It is only by passing through the true springs that efficiency can be secured. It is, therefore, necessary that drainers of springs should have an intimate knowledge of the strata of the district, to be able to distinguish true from temporary springs, and carefully investigate the nature of the strata of the locality to be operated upon, so as to mark well the bearings of the true springs before determining upon the lines of drains. Without such knowledge and precaution on the part of the projectors of such drains, great expense will be incurred in the operation, to little or no purpose.

From the foregoing remarks it may be understood that in draining springs the lines of main-drains must pass through the true springs, above the point at which they appear at the surface; and that the outbursts of temporary springs at a higher level must be brought into the main-drains by secondary drains. The outburst of a temporary spring, proceeding from the leakage of a true spring, will always disappear when the true spring has been efficiently drained. A single drain judiciously laid will frequently effectually drain several swamps and wet places caused by one and the same true spring, by relieving the pressure occasioning the outburst at the surface.

The most obvious mode of effectually draining a spring is to intersect the stratum in which it is contained, to its full depth; but it may, and frequently does occur, that to come to a spring a great depth of expensive excavation is required. This, in many cases, in which the water-containing stratum is known to rise, may be avoided by laying the drain at a depth of a few feet from the surface, and by sinking a well or pit, or by making a large bore-hole at one side, to the water-containing stratum, having the mouth above the level of the drain, and filling such well or bore, and also the excavation of the drain, to the depth of two feet, with small land stones; as in such case the pressure by gravitation will force the water above the level of the drain, and be thereby conveyed to an outfall in the nearest water-course. This was an expedient frequently had recourse to by Elkington and others, who practised the system of draining just treated of.

The only system or mode of draining remaining to be treated of, is the FREQUENT, THOROUGH, FURROW, or PARALLEL SYSTEM; and, which is also called the DEANSTON system, in reference to the late Mr. James Smith, one of the proprietors and the engineer of the Deanston Iron Works, near Glasgow, who is very generally considered to have been the inventor or originator of the system of draining in question. Although the system of draining now under consideration was, at an early period of the present century, in a few instances in use, yet it was not until about 1824 that Mr. Smith, with great enthusiasm, directed public attention to the great benefits to be derived from the system in increasing the fertility of the soil; and without his advocacy it might have continued for a length of time unacted upon; so that, although he may not have been in reality the original inventor of it, at any rate great merit is due to him for enforcing its general adoption.

It may here be remarked that the Elkington system already described, and that of the Deanston, depend almost upon diametrically opposite principles. In the former, springs are supposed to be the sole cause of injurious wetness in land; whilst in the latter-mentioned, the injury to the soil by wetness is considered to be occasioned by rain-water being upheld on the surface by an impervious subsoil. If, however, the subject be duly considered, it will be found that springs are less frequently the cause of damage to the soil than surface-wetness from rain—at least the former is not so extensively so as the latter-mentioned; and that neither is

the sole cause of injury, but that it may arise from either, and from both.

The errors hinted at have arisen, as in many other important matters, from a blind enthusiasm of the originators and advocates of particular systems, which has generally at length given way to a dispassionate investigation of the principles on which they depend. In further illustration of the marked difference in the systems of Elkington and of Smith, it is only necessary to point out, that in the former the drains are required to be laid at a considerable depth, and are always carried directly or nearly perpendicular to the direction of the slope in rising ground; whereas, in the latter-mentioned the drains are laid not more than two or two-and-a-half feet below the surface, and they are generally, as they should always be, carried in the direction of the slope.

It will be understood from the foregoing remarks, that both of the systems of draining adverted to are partial in effect and limited in operation. Elkington's does not, nor is it intended that it should, relieve the soil from surface-wetness; whilst the Deanston method is equally ineffective in removing underground-water. The inefficiency of the Deanston system has, in many instances, caused it to be looked upon as a useless expense; yet, nevertheless, its introduction may justly be considered valuable as the means of removing unhealthy wetness off the soil, previously generally disregarded by cultivators, and as leading to a modification of the system by which much greater, and, it may be said almost universal, efficiency may be attained.

To produce efficient drainage as a basis of improvement of the fertility of the soil, both underground and surface-water must be dealt with, and, when in redundancy, removed from the reach of the roots of plants, and from contact with earth of an absorbing nature. If the case of a somewhat flat surface of clay or peat, even of many feet in depth, incumbent on wet sand, be taken, it will be found that the water from that will be continually rising to the surface through the superincumbent earth, precisely as water ascends in a piece of sugar or a sponge in contact with it; and however frequent shallow drains may be laid in soils under such circumstances, they will have no effect whatever in preventing wetness at the surface from the ascension of water from below. The only benefit to be derived from such a mode of draining is the removal, or rather the interception of suddenly-thawing snow in winter, and heavy rain-fall of thunder-showers in summer from the surface, or prevent the passing of such water from the surface to the water-containing bed of sand after super-saturation of the surface soil.

A much more efficient and more generally applicable system of draining than had previously been practised in modern times consists of a modification of the Deanston method, introduced by Mr. Josiah Parkes, consulting engineer of the Royal Agricultural Society of England, about 1846. The mode of draining as introduced by Parkes is similar to the Deanston system, in the drains being at frequent and regular intervals; but the former-mentioned differs from the latter in the drains

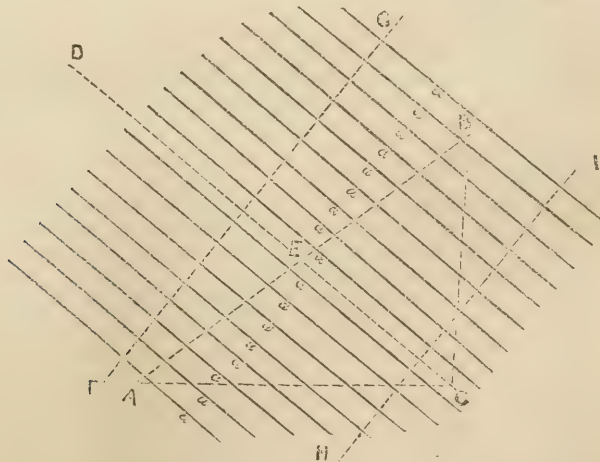
being at a considerably greater depth, and in their distance apart being in some measure, under circumstances to be explained hereafter, regulated by the depth. The depth of drains under Parkes' mode being much greater than that in the Deanston system, the former method will intersect a greater number of under-ground water-feeders, and thereby prevent their outburst at the surface, than the latter, and so, in some measure, perform the functions of Elkington's system of draining.

The first object, in draining by the system now being treated of, is to determine upon a proper outfall of drainage water from the covered drains into some trunk drainage or natural watercourse, which should be prepared or put into a state of efficiency, to convey the water from the main drains without impediment, or with as little obstruction as circumstances will admit of. The next matter to be attended to, is to trace a main or receiving drain from the outfall at the trunk-drain along the lowest level of the ground to be drained.

Although a very trifling fall will give motion to water, yet, whenever it can be avoided, no drain should have a less descent than 10 feet per mile, or $1\frac{1}{2}$ inch to a statute chain of 66 feet in length. A greater fall, however, than 8 inches to a chain in length is not to be desired. Whenever the descent of ground in which a main drain has to be carried exceeds 10 or 12 inches to a chain, it will be preferable to lay out the drain in lengths or reaches, at uniform falls of less than 8 inches to a chain, and connect such lengths by inclined planes—letting down the water from the lower end of the higher length to the higher end of the lower length—than to maintain one uniform descent with so great a fall.

When the ground is flat, and the subsoil of a uniform nature, it matters not in what direction the drains run, provided the main or receiving drain be along the lowest level of the ground to be drained. When want of sufficient fall may necessitate the bottom of a main drain at its outfall being on a level, or nearly so, with the bed of an open watercourse into which such main drain is discharged, it will be advisable to have, here and there, settlers of brick-work in the course of the drain, with their bottoms below the bottom of the drain, and carried up to the surface, where, having lids, the drain may be examined at different points in its course, and any solid matter that may have entered the drain removed. One of such settlers should be near the outfall of the drain.

On sloping ground, the direction of the collecting drains should always be in the direction of the slope, and not across it; as by the former-mentioned direction every stratum in the subsoil to the depth of the drain is certain to be intersected, by which the water from the feeders in the subsoil will be intercepted and carried off before coming to the surface; whereas, by the latter-mentioned direction, the drains will be as likely to miss as to intercept the water-feeders in the subsoil, and will, therefore, be uncertain in efficiency. It very seldom occurs, however, that ground slopes entirely in one direction. When the surface of the ground slopes in two directions, the most proper direction in which the drains should be laid off is in an oblique direction between the two declivities, nearer of course to that of the greater, by which the direction of the water at its discharge into the main drains will be incline to the direction of the currents thereof, and so offer the least interruption to its free discharge.



The foregoing diagram shows a convenient mode of laying off collecting drains. Take any point, *c* being an intersection of the direction of two given slopes of surface, *cA*, *cB*, and from *c* to *A* and *B* measure any two lengths proportionate to the rates of fall of the said slopes. Measure in a direct line the distance between *A* and *B*, and set off *AE*, half the distance *AB*; then *E* will be a point in the proper direction of the collecting

drains from *c*. Let the line *cE* be extended towards *D*. Trace lines *FG* and *HI* square to *CD*, and upon such square lines set off, at any required distance apart, parallel lines *a, a, a, a, a, a, a, a*, for the direction of the collecting drains required.

The most convenient instrument for setting out the lines *FG* and *HI* square to *CD* is a reflecting square, which may be carried in the waistcoat pocket.

Where several undulations of surface occur, a separate system of the direction of the collecting drains must be applied to every alteration in the plane of the surface, so that the direction of the drains in each may be that inculcated in the above-directed mode of laying out collecting drains.

On ground having a considerable declivity, or on which the declivity has several gradients, or even in large fields requiring great continuous length of collecting drains, it will be proper in the first and last mentioned cases to have one or more sub-main drains across the direction of the collecting drains, and having such obliquity of direction across the declivity of the surface as to afford fall for a tolerably rapid current of water; and in the second-mentioned there should be a sub-main at the bottom of each gradient. The sub-mains are required to prevent the wash likely to take place in heavy summer showers after long-continued drought on clay soils, or to relieve the small drains and prevent their being blown from being overcharged from any cause whatever.

The most vexed question relating to *thorough draining* is the depth at which the drains should be laid. In regard to this, it may be remarked, that no specific rule can apply, as circumstances may render a difference, not only in contiguous fields, but even in the same field, necessary; and hence arises the discrepancy in opinion that exists on this point. It may, however, be remarked that failure in efficiency in draining never arises from drains being too deep, but frequently from their being too near the surface. Thus the ducts may be laid above the principal water-feeders in the subsoil, in which case the drains will obviously be of no use. A drain, however, may be deeper than necessary, and, therefore, improper on the score of economy.

Now, since drains may be too near the surface to be efficient, and, if deeper than necessary, needless expense will be incurred, the proper depth of drains in any particular case can only be determined by trial pits being sunk. In making such trials, the pits should be sunk to different depths, noting which draws most efficiently, and adopting the least depth producing the greatest effect.

As the subsoil may vary greatly in its nature in the same field, so the depths of the drains may be required to be varied to produce the best effect at the least cost. As a general rule in regard to the depth of drains, the more compact the subsoil in which the drains are to be laid, the deeper should be the drains; since water-feeders in a compact subsoil being smaller than in that of a more open nature, it will require a greater number of feeders to be in action in the former case than in the latter, to discharge the same quantity of water in an equal period of time.

It is scarcely necessary to remark that, whenever the collecting drains are at different depths, the receiving or main drain into which they are discharged should be sufficiently deep to receive the water from the deepest of the small or collecting drains.

The proper depth of drains being determined by the means pointed out, their proper distance apart may be

determined by their depth and nature of the subsoil in which they are to be laid.

Collecting drains, not exceeding six feet in depth, will draw water from two to three times their depth, on each side, in the purest and most compact clay; from three to four times their depth in clay containing nodules of gravel; from four to five times their depth in clay with seams of sand or gravel; and six times their depth in the most open subsoils.

The distances apart at which drains should be laid, in terms of their depths, according to different kinds of subsoil, are as follow, viz. :—

Nature of Subsoil.	Distance apart of Drains.
Strongest clays	4 to 6 times depth of drain.
Clay mixed with nodules of gravel	6 to 8 " " " "
Clay, with seams of gravel or sand, according to the thickness of such seams	8 to 10 " " " "
Sandy or gravelly subsoils ..	10 to 12 " " " "

In drains not exceeding six feet in depth, the foregoing rule will be found to agree pretty accurately with the most successful practice; but at greater depths, which, however, are seldom required in ordinary field draining, the distance apart of the drains under different circumstances as to subsoil must be determined by the experience of the engineer or drainer designing or conducting the work.

Common clay tile is the best material for the ducts of drains, and the best form for the purpose is a plain hollow cylinder. Such tile pipes are made by the tile pipe machines in great perfection, and where fuel can be had at a reasonable price they may be produced at a very cheap rate. Drain pipes are usually made by manufacturers of from one to nine inches bore, and they may be obtained of even a larger size when required. The usual, and indeed, the most convenient lengths of tile pipes are from twelve to fifteen inches for those of from one to six inches bore, and twelve inches in length for those above six inches in diameter.

Tiles that have not been thoroughly air-dried previously to being fired, those made from clay with too large a mixture of sand, or having nodules of lime or chalk in it, and those that have been made during frosty weather, should be rejected. Tiles of good quality are heavy, and emit a ringing sound when struck; but they should not be so hard burnt as to be vitrified in the fire. The quality of drain pipe tiles should be that of the best garden-pots; and the best mode of testing their quality is to steep them for three or four hours in water, and then to place them before a fire; and should they remain hard and whole after such an ordeal, they may be safely used.

The size of pipe is a matter of much importance, and should have consideration both for the collecting or small drains, and for the leading or main drains. For collecting drains, unless the drains are short, are not far apart, and the current brisk, one inch bore is too small. A much more useful size is two inches, and then the length of the drains should not exceed ten chains, the distance apart thirty feet, and the fall at least one-and-a-quarter inch per chain of twenty-

two yards. The lower portion of small drains exceeding ten chains in length should be laid with three-inch pipes, and towards the junction with main drains exceeding twenty chains, especially in flat ground, should be laid with pipes of four inches bore.

In making an estimate for the size of pipes to be used in main drains, the rainfall of the district in which draining is about to be undertaken, the fall of the drains, and the extent of ground from which water has to be discharged, must have attentive consideration.

As to the first of the above-mentioned topics, that of amount of rainfall, it varies on an annual average very greatly in different localities in the British Islands. In some localities the average annual rainfall for a number of years has been observed to have scarcely exceeded 20 inches in depth; whilst in others it has amounted to 60 inches, or three times the quantity. Let the aggregate quantity of rain falling in any district over a lengthened period be what it may, one inch falling within twenty-four hours would almost be considered a phenomenon in the wettest district, and one-half or one-third that depth falling in other places in the same time would be equally remarkable. For purposes of the estimate now being discussed, the greatest rainfall need not be provided for, as it is well known that a great portion of the actual rainfall in a district is disposed of by various other sources than drains, even when these are most effective. Amongst the means by which water is carried from the soil, otherwise than by filtration by drains, the following may be adverted to:

Evaporation from the surface by the atmosphere, the power of which is influenced by its heat, its state of dryness, and by its motion. The atmosphere has most power in removing water from the soil during June, July, and August, and least during December, January, and February.

The nature of the soil in its power of retaining water in absorption. The kinds of soil most retentive of water are peats, and those containing a large proportion of fibrous vegetable matter in their composition; and the least are those of an *arenaceous* kind.

All plants remove a great portion of water from the soil during the active state of their vegetation, and the time when this is most powerfully in action is during April and May.

Taking all causes into account which may dispose of rainfall by other means than by filtration, a provision

for more than one-third of the heaviest falls in the district need not be provided for to be carried off by drains in twenty-four hours.

The velocity of water running in covered drains is found by the same rule as previously given for open water-courses, and which is to multiply the square-root of the product of the rate of fall of drain per mile in feet by the hydraulic depth, or radius of the section of the drain in feet by 82.5, and the product is the velocity of the current of water in feet per minute. For drain pipes, the radius, or one-half the diameter of the bore, is to be considered the actual depth, and one-half the radius, or one-fourth the diameter of the bore, the hydraulic depth or radius of the section.

The following are the hydraulic depth, in feet of tile-pipes from 1 to 12 inches diameter of bore, for finding the velocity by the foregoing rule; and of the semi-circular area of the section of the pipes in square feet, for finding the discharge in cubic feet, when such area is multiplied by the velocity in feet per minute.

Diameter of bore in inches.	Hydraulic depth in feet.	Semicircular area in square feet.
1	0.2083	0.02727
2	0.4166	0.109
3	0.625	0.245
4	0.8333	0.436
5	1.1416	0.6815
6	1.25	0.9315
7	1.4583	1.336
8	1.6666	1.745
9	1.875	2.208
10	2.0833	2.727
11	2.2916	3.299
12	2.5	3.927

The writer has constructed tables for finding the results of all the rules for calculations required in the execution and estimating the cost of draining, if not in all cases by inspection, at any rate by the addition of a few lines of figures, which probably may, at some future time, be published, with an extension of the present article in the form of a book.

So well adapted are tile-pipes for the ducts of drains, that they should supersede the use of every other material for the purpose, wherever they can be obtained at a reasonable cost, and, from the facilities of transport by railway communication in every direction throughout the United Kingdom, will in very few localities not be the case.

Newcastle-upon-Tyne, March, 1861.

THE PROGRESS OF THE STEAM PLOUGH.

A vague notion has got abroad that steam-power, when harnessed and worked as it should be, will accomplish results in field-labour incomparably greater than any yet produced by steam ploughs or farm locomotives. Look at the factories, people say: steam does not barely surpass the former rate of production by hand, but multiplies it by tens and hundreds. One woman now manages seven hundred spindles, each twisting at the speed of

five thousand revolutions per minute throughout a ten-hours' day, instead of working only one spindle at a time, with a slower motion and frequent rests, as she was formerly obliged to do. Look, again, at the steam road, with its load of a hundred tons flying along at thirty miles an hour, compared with the horse road, with its load of two or three tons dragged three miles in the same time. Steam must equal results like these in agriculture, if it be worth anything; and no Fowler,

Smith, Halkett, or Romaine has yet conceived the immeasurable wonders which are in store for the future farmer. What is the now accomplished fact of tillage at half-price or double depth, or the dispensing with one-half of a farm team? Let us have twenty acres tilled a foot deep in a day, at a cost of common horse-ploughing; or a hundred acres of wheat carried to the rick-yard between dawn and dusk, using only one horse for fetching the engine's drink—and steam culture may then have somewhat to crack of. Such great expectations have been raised by speculative writers and by imaginative speakers, that there is a wide-spread tendency to disparage the inventions already before the public, and to conclude that, because the grand ideas of theorists and rhetoricians have not yet been realized, it is wise to wait until something wonderful turns up. Will our sanguine friends, therefore, permit us to expose the fallacies which we believe lurk at the bottom of their hopes?

If we were addressing the practical man only—who is quite willing to improve the nett income from his farm, if we can show him how—it would merely be necessary to demonstrate that a steam plough or cultivator, costing £500 to £700, is a good investment for capital, certain to yield a very handsome profit. And any machine which will give in saving of horse-keep and increase of cropping some one to two or three hundred pounds clear annual proceeds from the above outlay, ought to be considered a successful invention, and a great boon to the farmer. But we wish to dispel the illusive fancies of those persons who will not be satisfied with a steam plough that can only relieve them of difficulties, set a bad business on its legs, and make their agriculture a profitable instead of losing game—who demand wondrous, almost incredible results, and declare steam cultivation to be otherwise a failure.

In the first place, the examples of the factory and railroad do not fairly apply to the case of a farm. The weight of raw material obtainable by the manufacturer is unlimited, and the pace at which spinning is possible depends solely upon the capabilities of the machinery employed. But the arable field is open to but slight extension—namely, by increasing the depth of staple; and its conversion into crops depends but little upon the power of the mechanism used for tilling it. Seed-beds when prepared must await the influences of a year's meteorology before the grain, the roots, or the fodder can be gathered. The manufacturer doubles his motive-power, and thereby doubles the amount of his products; or applies ten-fold the power, and gets ten times the product. But the farmer, from the very nature of the vegetation he is confined to, cannot do more by any mechanical assistance than improve and expedite the processes of tillage which at certain seasons prepare for or promote the growth of crops. Still, in these operations, it may be said, steam-power ought to exceed amazingly the present slow-coach work of horses, in similar proportion to its achievements on the railway. Now, here again is an unfair comparison. The task in the field for the steam-engine and for the team is the same: the soil has to be broken up, sub-

divided, perhaps inverted, or thrown into such forms of surface as are required for the crops. But on the road it is not so. Let steam attempt to drag loads on the same terms, that is, along the same rugged roads that horses travel on, and we have yet to learn that any very surprising results have been attained. Steam locomotion has done wonders by leaving the horses' task altogether, and running upon a pathway expressly provided for it. And, if the comparison be made at all, it should be between steam-power and horses pulling loads upon the same level iron rails, when it will be found that the superiority of steam traction consists in rapidity, steadiness, and untiring persistence—just as we find in steam ploughing; and the weight capable of being hauled by horses is wonderfully increased by the railroad, as well as that possible by the traction of a steam engine.

And now let us make just a simple calculation, based upon what is known to be the resistance of soil to the best-formed implements, and the known power of a steam-engine, in order to see what reason there is for expecting hitherto-unheard-of results in the performance of steam culture. Take 34 stones as a common draught of a plough doing 7-inch deep work, owing to the sledging action, the draught of the plough empty will be about 12 stones, as proved by many experiments with the dynamometer, so that the remaining 22 stones of draught is all that is due to the labour of cutting and turning the slice. A Fowler four-furrow steam-plough may be taken, therefore, as having ($22 \times 4 =$) 88 stones draught due to its work. As the weight of the plough in work is balanced by that of the other set, the draught due to the plough empty is just that of the implement riding on its wheels, which, judging from the allowance made for carts in ordinary farm roads and the surface of unploughed land, will be about 20 stones. In the absence, then, of any direct experiments with the machine, we may fairly take the total draught of the 4-furrow steam-plough at about 108 stones in cases where one ordinary horse-plough has a total draught of 34 stones. At the rate of 3 miles per hour this draught of 108 stones is equivalent to 1,512 pounds raised 264 feet per minute, or to 399,168 pounds lifted 1 foot per minute. And as a mechanical horse-power is 33,000 lbs. lifted one foot per minute, the power expended in working the steam plough is that of 12 horses. Now let it be observed that, in this fair and average case, the mere execution of the tillage itself demands no less than 12-horse power applied at the implement; where then is the margin of possibility of making a common portable engine, or indeed any engine, accomplish very much more work? When it is considered that in any way by which the motive power may be communicated to the implement—whether by a wire-rope, or a flying hemp rope, or by causing the engine itself to travel—a large amount of power must necessarily be consumed between the engine crank-shaft and the plough, by friction and inertia of the moving parts, it will be seen that only a small increase of economy of motive power can be hoped for, in any future invention,

It may be objected that the plough is an implement which, from its screw-wedge action, wastes much force in overcoming the mere friction and cohesion between the mouldboard and furrow-slice; and that a great deal of power will be saved by using a better form of tool. But dynamometric experiments show that the removal of the mouldboard from a plough, when the total draught is 34 stones, lessens the draught

only 3 stones; and accordingly, if we suppose the four mouldboards taken off the Fowler plough, there will be only 12 stones less draught, out of 108. And the plough share is not so badly shaped for cutting and riving up the soil, that any vast gain of power is likely to be obtained by any form of cultivator tine which may be equally effective in severing and shattering the ground.

THE DAIRY AND ITS MANAGEMENT.

The high price which animal produce of all kinds has for a long time maintained, and the certainty that no existing circumstances are likely to reduce it in future, but that, on the contrary, there is reason to think that, with an increasing population and a flourishing state of the manufactures, prices will rather advance than recede, it becomes a question of some importance to the farmer whether it may not be more to his advantage to lay down more land in grass, than to keep it under the plough for growing white crops.

It is not, however, our intention in this paper to go into the general question, but to confine the remarks which follow to one department only of rural economy, namely, the dairy. This has of late occupied, to a large extent, the attention of agriculturists at their public meetings; and some excellent papers have been read on the subject. The prices indeed that are now obtained for butter and cheese are quite sufficient to tempt the farmer to make a change in the routine of his system; for owing to the facility afforded by the railways, these, as well as other articles of produce, are now as high in price in the country as in the metropolis and other large towns—in some cases, indeed, higher, so completely are those districts cleared to supply the London market.

To satisfy ourselves of the true cause, and its extent, for this long-continued and steady advance in the price of butter and cheese, but the former especially, we have looked into the returns of the Board of Trade for the purpose of comparing the increase of the importations with that of the consumption, and the following is the result ...

Imports of butter in 1842....	175,497 cwt.
" " 1856....	514,764 "
Increase	339,567 "
Imports of cheese in 1842....	179,748 cwt.
" " 1856....	407,076 "
Increase	227,328 "

The increase appears large, but in reality it is far from being adequate to the increased consumption, which arises from the two permanent causes named—the increase of population, and the flourishing state of the manufactures. The first alone indeed would require a much larger increase of supply, being at the rate of at least 300,000 a year, which in fifteen years gives an aggregate increase of 4,500,000. If we reckon the

consumption at half-a-pound of butter each, per week, it makes 117,000,000 lbs., or 1,044,642 cwt., which, upon the score of population alone, ought to have been the increase of the importation of butter, instead of 339,567 cwt., or not quite one-third. If, then, we add to this the enormous increase of consumption arising from the improved condition of the operative classes throughout the kingdom, there will be no room for surprise that butter has risen 50 per cent. the last 15 years, or for any fear that it will recede in price.

The same reasoning will apply to cheese, eggs, and every kind of animal food. The increase of import or supply cannot keep pace with that of consumption; and as the home production of these two articles has not proportionately increased, we consequently find the price continually advancing, without the smallest chance of being reduced in future.

Taking this view of the case, the question of the superior advantage of grazing over corn-growing does not admit of a doubt. Our attention has been now directed to the subject by the perusal of several essays on "The Dairy," and especially by two works recently published in Edinburgh: one by Mrs. Agnes B. Scott, of Winkstone, Peebles; the other by Mr. John Gamgee, Professor of the Veterinary College, Edinburgh. The question has also been lately taken up by two local agricultural societies; at the Berkeley and Thornbury, where Mr. Bailey lectured on Dairy Farming, making the point of his paper a protest against over-feeding; and again at the Winfrith Farmers' Club, when Mr. White discoursed on the dairy and young stock, opinion being here much divided as to the best breed or cross for milking purposes. Mrs. Scott's little tract is the result of nineteen years' experience of dairy-work, during which the produce of her forty cows always brought her the highest price at the Edinburgh market. Upon her retirement from business, some of her friends requested her to tell them the secret of her success. She complied, by publishing her tract, which in twenty pages gives as complete a course of dairy management as is needful to direct any one in all its essentials.

Professor Gamgee's work is of a more general description, and embraces the choice of cattle on scientific principles, in the formation of a dairy. He agrees in this respect with most of the best informed and practical men, that the Yorkshire short-horns are in every respect the best adapted to the dairy; and although

the Suffolk polled, the Ayrshire, and the Alderney breeds have still their advocates, the short-horns are now the dominant race in every dairy district in the kingdom. They are found not only to yield a large meal of milk, and to hold their milk longer after they are in calf, but the calves make more valuable oxen, and the cows, after five or six years' milking, fatten readily, and make good beef. The milk, it is true, is less rich in cream than the Devon or Hereford, and a cross between either of these and the short-horn has been found to improve the quality of the milk, without deteriorating the cattle in other respects.

For private families the Alderney has hitherto been a great favourite, both on account of its milking qualities, and its quiet and gentle disposition. A new race, however, has recently been introduced from France, that is likely, we think, to obtain some patronage as a family cow: this is the Bretonne breed, of which a considerable number have been brought over and sold for that purpose. These little animals—for they are rather smaller than the Kerry cow—give a good meal of milk (say from five to seven quarts a-day), cost very little to keep, and are as quiet and gentle as a lamb, and will follow the person who tends them about like a spaniel, when kindly treated. At present, as novelties, they sell rather high; but when they become more common and cheap they will be well adapted to the cottager

who has an allotment of land. Unlike the Jersey cow, the Bretonne is a hardy animal, "active and strong, though gentle and quiet. Hardy by nature, she thrives under any circumstances, and, when well cared for and stall-fed, fattens rapidly. She has indeed the greatest aptitude for laying on flesh so soon as the secretion of milk is suspended. It will be found that in proportion as they are allowed exercise, when well fed, will they continue to give much milk."

It is, however, with the dairy question that we have to do; and although some of the London dairymen have purchased the Bretonne cows, we believe they will be found less adapted to their purpose than the larger breeds, either in the metropolis or in the dairy districts of the country. It is to these that we must look for the great supply of butter and cheese; and we hope to find that by the appropriation of more land to pasture and less to white crops, that supply will be made to keep pace with the growing wants of our teeming population. Certain it is, that while the importation of corn annually increases, and that in favourable years, when our native crops are good, the farming interest is liable to be swamped by an excess of foreign corn, the imports of animal produce cannot be increased in an equal proportion. The supply is always rather below, than above or equal to, the demand.

A LORD ON LANDLORDS AND THEIR DUTIES.

It is by no means an uncommon occurrence to hear of a country clergyman addressing himself especially to an agricultural audience. If he should happen to unite with his clerical offices those of a landed proprietor, he is almost certain to have "a gift" in this way. Indeed, the exception is rather the reverse, when you meet with a Rural Dean *not* too ready to teach farmers their business as well as their more moral duties. Our own experience goes to show that our reverend friends are a little apt to make the most of such an opportunity, and accordingly toast-lists and the Society's agenda begin to evince some care in keeping the rector at arm's length. But when to the more every-day recommendations of priest of the parish and squire of the parish, a gentleman can add the weight of My Lord to his position and influence, the prospect improves; while, should he even eclipse the effect of all these three graces can do for him by his own innate abilities and reputation, one gets positively anxious to hear him. What can a clever fellow, who is also a Noble Lord, a well-to-do Vicar, and a smart writer, have to tell us about farming and farmers? The point, perhaps, would be rather be what could he *not* tell us? And acting upon this opinion, Mr. Fowler, the Chairman of the Blandford Farmers' Club, approached the Reverend Lord Sidney Godolphin Osborne, requesting his Lordship to address the members on "The respective Duties of Landlords, Tenants, and Labourers," or on any other question that he might prefer. Lord Sidney accepted alike the invitation and the subject.

There are few of our readers who will require to be told that under the well-known signature of his own initials, "S. G. O.," the reverend Lord has become

one of the great authorities of that great authority the *Times* newspaper. His letters are given in the largest type and in the best places; while his mission has been to show up abuses in the country, just as "Jacob Omnium" may have done in the city. Taking the agricultural labourer under his especial care, Lord Sidney's range of topics has branched very much into those three upon which he concentrated his strength last week at Blandford—the Landlord, Tenant, and Labourer. Here, however, their order and importance are reversed. In the columns of the *Times* the Labourer has been the text-word, and the other two classes only incidentally touched upon. At the little local Farmers' Club, on the contrary, the duty of the Landlord was the chief feature of the address. It was upon his conduct that the fortunes of the others were made to depend; and we shall follow his Lordship's lead in taking it as in every way the first for consideration.

Lord Sidney begins well. "The landlord of the present day has to take anything but a superficial view of estate management. His tenants are contending with the world's markets; investing a very large capital in their business, subject to the uncertainties of the seasons, and sudden turns of the markets; their taxation is very heavy," and so on. As a consequence we are assured that "it should be a cause of very great thankfulness to every thinking man that the landowners have very generally become practically acquainted with the exigencies of modern farming. They may not have arrived at a perfect knowledge of all the trials of tenant farming; but they have acquired some knowledge of what it is exposed to." And so his lordship draws on to his first strong point, the letting

of land by tender. "If an estate were viewed simply with reference to the utmost rent it would yield, the agent and solicitor, properly instructed, could do all that was necessary. It would be a matter of letting by tender or skillfully-drawn covenants, professing to cover all the claims of a long lease, bringing all contingencies on either side down to a line beyond which neither party was legally liable." With, however, the landlord of the present age in his eye, "who has become practically acquainted with modern farming," S. G. O. is inclined to look with but little favour on this system of letting. As he says: "A tenant will only have obtained his farm by outbidding other competitors for it. We all know the weakness of human nature when exposed to the allurements of a sale by auction; how men will buy for the mere sake of buying, with little reference to the question of the value of what is bought. When the lots come home, then comes the hour of reflection, of conviction, of folly. A landlord by the tender system may obtain a very high rental; there will be competitors who, wanting farms; may have studied the real value of those offered, and every clause of the covenants under which they are so offered; exposed to the competition of others, who, like themselves, are seeking to settle in life, to invest their capital in that particular business to which alone they have been bred, it is a race in which all run, with their eyes open; but the very eager, and, perhaps, the best men will, for the time, have their understandings blinded. They listen to the encouraging statements of the agent, they become deaf to the less loud promptings of their own prudence; seeing the risk of the offer they make, but hoping against hope, they bid high that they may not be outbid—they gain the prize. Now comes reflection. The lease is signed; the lot has come home; they cannot get rid of that which they deliberately purchased; it is not a chest of drawers or an unsound horse, obtained at an auction in the market-place, but a large farm, taken on a twenty-one years' lease. I say the occupier of such a farm may be a good farmer, and what is called a good fellow; I do not believe he will be, in my sense of the word, a good tenant. He is the voluntary victim of a very hard bargain; and I say it is the duty of a landlord to abstain from this system of letting." Never, certainly, have the abuses of letting by tender been so ably summed up, or the result of such a system more clearly shown, viz., that landlord and tenant will come to care little or nothing for each other beyond the actual terms of the hard bargain. Let an estate and a good man have alike the advantages of wholesome competition; but, however it may answer in Scotland, there are many reasons why letting by tender will never prevail in England. On the subject of leases, agreements, and tenant-right claims Lord Sidney touches more cautiously. Although he allows that on the part of the landlord "there should be no reserve as to the construction he puts upon the terms on which he lets his land; the real meaning of every clause, to its fullest extent, should appear, so far as plain words can give it, and this applies especially in the case of what are known as 'compensation clauses.'" On the over-preservation of game, however, he enters far more fully. In doing this, let us remember that it is a country gentleman who is speaking, one with the rank of a nobleman, and who has clearly alike a certain sympathy with the tastes of those of his own order, and an intimate acquaintance with the abuse he condemns:—"Assuming this high preservation of game is of old date, I am still not at all surprised that to the tenant-farmers it is now a far greater source of complaint than it used to be. They now, in farming, fight a pitched battle with the corn-growers of all countries.

Good farming is now a matter of very close calculation; the loss of so many poles of this or that field's produce, by the feeding of hares and rabbits, is a matter plainly appreciable in the calculation of any given year's probable return. Good farming is almost garden farming, and it is easy to imagine the annoyance to the eye, as well as to the pocket, which the ravages of these animals in large numbers make on the farm. *It is my belief that, by degrees, the present very high preservation of game will diminish, and at last cease altogether, wherever it exists to the injury of highly-cultivated land.* I do not, however, expect, nor do I desire to see the day, when landlords shall cease to take pleasure in the sports of the field. The right of 'chase' has ever been the most jealously guarded privilege of the owner of landed property. The value of land has ever been much enhanced from the fact that it secures facility for sporting purposes, thus affording a great source of amusement to the owner and his friends. Still it cannot be denied that all reasonable indulgence in sporting may be obtained on an estate at a far less positive cost to the tenantry than is now but too often the case in many counties. There is a limit at which the exaction of a right borders on the perpetration of a wrong. As to the duty of the landlord in the matter, it resolves itself into this—Is he dealing as he would be dealt by, if he systematically keeps up a large head of game so close to a tenant's occupation as necessarily to inflict much injury on that tenant, admitting that he has the clear right to do so by the actual letter of the lease under which the said tenant occupies? I may be told there is a compensation clause in the lease or agreement, giving a right to claim payment for damage done. I confess I regard such a clause, however just in theory, to be one which in practice is rarely available for the purpose for which it is ostensibly drawn. There can be no doubt that the practice pursued on many estates, of selling the game, has aggravated the irritation of the tenantry in the matter, whenever there has been much damage done; with some truth they say their farms cease to be more than mere pasture for birds and animals which are to give their landlord and his friends sport; they are grazing fields for stock, much of which they breed and feed, but he, for his own profit, sends to market. I have never yet discussed this subject with any liberal-minded landlord who did not allow the full weight of the evil this high preserving produces between tenants and the owners of land." There is much more to this effect: while from all sides we begin to hear that the very high preservation of game is diminishing, and that all liberal-minded landlords admit the full weight of the evil. Lord Sidney's comparison between true sport and artificial excess is identical with the distinction drawn at the Central Farmers' Club just a year since. But if our readers would like something of another colour, let them turn to the next page, and study the last of Alderman Mechi's FARMING ECONOMICS, wherein elaborate instructions are given for feeding hares and rabbits on swedes and mangels, for killing cats, and for taming pheasants! Of course the lecturer as a clergyman could not but see the harm this over-preservation of game does to the labouring men—"like the gaudy gin palace to the poor of towns, it is a lure to evil too often entangling the steadiest, and from which the young and adventurous seldom escape." So far his audience went very heartily with their noble friend; but in considering the case of the working man, and the duty of the landlord towards him, Lord Sidney insisted that the comfortable cottage should be let direct from the one to the other; that is, that the farmer should have no control

over the occupier. The tenantry present appear to have generally demurred to this; and it is difficult to imagine anything more annoying than for a large holder to have a discharged servant living, as it were, in open defiance of his former employer. In his reply the lecturer qualified such a right for the landlord; while the general tone of his paper evinced a liberality of sentiment, coupled with a shrewd business-like view of agricultural dealings, and a fair consideration of the claims of all classes, that must add yet more to the fame of "S. G. O." Duly remembering, may be,

where and to whom his speech was to be delivered, it is marked by a certain temperance of tone not hitherto so observable in his Lordship's writings. In a word, with the tact as well as the talent of a clever man, the address was as admirably fitted to those it spoke to, as to those it spoke of; and, coming from such a quarter, it cannot fail to have effect. The vote of thanks, then, passed by the Blandford Farmers' Club to Lord Sidney Godolphin Osborne was no mere matter of form, as seldom has such a compliment been more fairly earned.

FARMING ECONOMIES.

THE GAME QUESTION.

Can it not be rendered agreeable to all parties? Being an old sportsman myself, fond of a little game preserving, and yet having the greatest aversion to injuring farm crops or irritating my neighbours' feelings, I enter upon a consideration of this question without prejudice.

I suppose we are all agreed that every man has a right to enjoy himself in his own way, provided he does not infringe on the feelings or interests of others. I am therefore going to show that an abundance of game well fed need not be injurious to agriculture. I speak practically on this matter, for although two wheat fields and a clover field adjoin the wood in which I have many hares and rabbits, not a blade is consumed, and scarcely ever does a rabbit make its appearance. Methinks I see a good many holders of game farms gravely shaking their heads; but facts are stubborn things. The whole question hinges on four words: "Feed in the cover." Nothing runs away from its dinner. Where the food is supplied of the right kind, and at the proper time, there shall we all be found. So it is with game. Their shy and retiring habits naturally dispose them to cover. I know it is the custom with many game preservers to feed their pheasants; but do they feed their rabbits and hares? Very rarely. A farmer said to Lord C. recently, "Your lordship has, I fear, lost your game by poachers, for I have seen nothing of them lately." His lordship smiled, and said: "The fact is I have carted into and distributed over my covers sundry loads of swedes and mangels, and that accounts for your not seeing the game." This is my own practice; and you will find the mangel, swedes, or carrots shelled to a nicety.

I was shooting last season in some cover with some knowing game preservers, who were *farmers*. I saw the mangel and carrots lying about inside the wood. The consequence was, in one wood we bagged sixty-six hares; but you might beat the surrounding fields without finding half-a-dozen. They were at home, and had their meals provided for them there. During the late severe weather I could track the ground game all over my cover like a sheep-walk, but not a footmark was to be found in the surrounding fields. I assume, of course, that you keep down cats and other vermin that would disturb your game and drive it away.

It is easy to comprehend that animals or fowls of any kind, if unfed at home, must go elsewhere for their sustenance. They must be fed somewhere and by somebody, or they would starve, which they will take good care not to do, so long as something can be found somewhere.

I wish to impress very strongly on all those who must feed game, whether as landlords or tenants, that they should use a ripened or full-grown crop for such purposes, and thus

prevent the frightful losses resulting from compelling game to feed on germinating or young growing crops. Let me illustrate my meaning. A hare when ready for the spit will weigh $4\frac{1}{2}$ pounds, and when alive would consume daily fully 1 pound of mangel, or a trifle more of swedes, on the same principle that a sheep or bullock, when fed on turnips alone, will consume rather more than one-fourth of its net dead weight daily; of mangel it would be rather less than one fourth. A rabbit, weighing $1\frac{1}{2}$ pounds ready for the pot, would consume 6 to 7 ounces of mangel daily. Of course, if they consumed other food, they would require less roots; but, as a general rule, I find that hares and rabbits will not touch the young wheat plant or clover, so long as they have access to roots, either mangel, turnips, or carrots. Now, let me draw my moral. A hare sits down quietly in the wood, and enjoys his pound of mangel, a ton of which, at cost price, 6s. 8d., would last him 2,240 days, or $6\frac{1}{4}$ years, at 1s. per year. But supposing you do not provide this mangel, how many tiny tops of budding wheat or clover plants must he destroy to equal this 1 pound of mangel, and how much ground will he clear daily? Take, for instance, a nice crop of winter tares or early peas, just pushing through the surface, and see how soon a score of hares will clear an acre and ruin the crop.

I happen to have in hand at this moment, as arbitrator, a case involving a claim for damage by game, and the evidence submitted to me powerfully confirms the view I have taken, that it is ruinous policy to allow ground game to consume the early sprouting shoots of tares, clover, peas, carraway, or other crops, without entering into the question as to whose duty it is to feed the game. I would strongly recommend all farmers who hold game farms, when the landlord will not feed his ground game, to have an ample supply of roots, and feed them themselves just inside the wood, and they may rely on thus saving their growing crops. Every ton of roots so used will save them many times its value in the growing crops—a pretty good profit. It will spare much heart-burning, and perhaps a few lawsuits. On the other hand, landlords may enjoy abundant *battnes* and yet let their land at its full value to contented tenants, if they will take my advice, and feed their ground game with full-grown roots. It is necessary to continue the supply of mangel until June, or, at all events, until grasses and clovers are fully developed, because then the damage is insignificant. Some tares, second clover, and early turnips are desirable for autumn feed. A belt of rapid-growing giant rye near the cover, well manured, affords cheap and abundant spring food. Pheasants, like barn-door fowls, are very fond of mangel and roots; they are also very fond of

sprouted grain and sprouted pulse, because the starch is then converted into sugar. Therefore, as the corn comes up, feed them with germinated corn, and so save them the work of injuring your plant by plucking it up as it pushes from the soil. A full-grown pheasant will, during winter, consume at least 2 ounces of corn daily.

I beg to express my conviction, contrary to the general opinion, that rabbits and hares can be much more economically fed as game than pheasants. The former will have few competitors for their food, which will in fact be nearly all consumed by them; but it is far otherwise with pheasants, for every peck of barley and beans consumed by them, probably as much or more will be eaten by small birds and woodpigeons which are by feeding attracted in large numbers. A friend of mine, who keeps 60 pheasants on about an acre of ground, planted and netted over, finds that they cost him about £15 annually for food; but when he turned down a number in his wood, and fed them there, the expense was very greatly increased, and he discovered that they had many competitors for their food. He therefore considers it cheaper to rear and turn down pheasants, than to keep so many wild. Probably the most economical way of feeding pheasants is with those self-acting iron troughs, which open only when the pheasants perch upon them. Beans and Indian corn are too large to be eaten by very small birds, and therefore more economical than barley.

There are seasons in the year when winged game benefit the farmer by the destruction of an immense number and variety of flies, grubs, and insects. High farming is a good protection against game damage. The poor miserable unremunerative crops of undrained and ill-farmed heavy lands suffered immensely the last cold and wet season by game

damage, the protracted harvest exposing the crops for many weeks to depredations by game and other wild birds.

Yours, truly,

March, 1861.

J. J. MECHE.

P.S.—A friend shot a full-sized woodpigeon to-day, and on opening his crop I counted out 41 full-sized beans. As 30 average beans weigh an ounce, and as at 40s. per quarter every pound of beans would be worth a penny, it follows that this pigeon would consume annually (at 41 beans per day) 14,965 beans, weighing 498 ounces, or 31 pounds, which, at 1d. per pound, would be 2s. 7d. annually for one pigeon. Whether this pigeon had finished his dinner or not, I cannot say, or whether he breakfasted and supped as well as dined; but, at any rate, 41 appear to be his minimum number. My friend says that a woodpigeon would consume that number twice a-day. I should recommend poultry fanciers to weigh the corn consumed by their fowls daily, and then they could estimate the profits or losses of feeding. If a pheasant consumes 2 ounces of corn daily, it would amount to 3s. 9d. annually. This expense may be much more than doubled if other birds are to share in their food. If any farmer has to feed 1,000 pheasants annually from his growing and ripened crops, it would be a very serious affair. Farmers should take especial care to cover their corn well by harrowing, or they may lose much of their plant by woodpigeons, rooks, and game.

[This is, perhaps, the most absurd and suicidal production ever written by any man aspiring to the position Mr. Mechi assumes, that of an Agricultural Teacher. The two great points of the letter are, that shooting tame pheasants is a commendable British sport, and fattening hares and rabbits on swedes and mangels a farming economic!—ED F.M.]

THE ECONOMY OF POWER.

Sources of large profit are so strange to the farmer that the revelation of anything like Aladdin's lamps or unexpected nuggets will be most safely made to him by degrees, as he may be found able to bear them. So often have over-sanguine expectations of enthusiastic minds, and conclusions from mere estimate and coloured assertion, proved miserably deceptive—particularly in such matters as deep drainage, purchased cattle-foods, and hydraulic manuring—that wonderful results, declared from whatever quarter, are likely to provoke the derision of the incredulous, and to be viewed by shrewd business-men as dubious and overdrawn. It certainly is not fair to class every extraordinary result among the shams which afford the commercial world an opportunity for ridiculing and decrying the stolid farmer, and the landlords an excuse for screwing up their rents; but still there are grave reasons why we should hesitate to publish miraculous increases of yield or lowering of expenses without ample caution and qualification, and we should have an eye to the extent to which the machine, the process, or the management producing the alleged gain, may be applied by the farmer generally. For, while on the one hand a great proportion of our agriculturists hold land with a very deficient amount of capital, and are unable to invest in heavy improvements, on the other hand there are not a few hungry proprietors eager to extort more rent under the pretext that their tenantry ought to mint money, according to the papers, by the modern inventions and discoveries. Both forget that our new mechanical and chemical means of more profitable husbandry demand first of

all an adequate capital on the part of the tenant, and a like liberal application of capital by the landlord; for no tenant can reasonably adopt a £700 steam-plough, a costly meat manufacture, a high artificial manuring, or venture upon a Lois Weedon annual wheat-crop, unless the landowner provides a perfect drainage by pipe and water-course, farm-buildings fitted with the needful machinery and convenient appliances, freedom for the tenant to make the most of the soil, and security for his recovering what he may invest in high management. Great advances upon our present modes of husbandry ought to be quietly and unostentatiously introduced; yet the difficulty is to awaken the attention of the farmer to a great improvement without chronicling results and publishing glowing accounts calculated to "open the eyes of landlords" before the tenantry had time to profit by the novel discovery. Hence, we may have unintentionally erred in announcing too abruptly the wonderful powers latent in the steam-plough, and calculating upon future profits too startling to be committed to the agricultural mind all at once. Perhaps the press might better help the cause of steam culture by recording results as they arise, than by computing future gains to be derived from the deeper and more perfect tillage—no matter how reasonable may be the figures of such an estimate. George Stephenson vouched for only ten miles an hour for his first locomotive, though he knew it would run more than double the pace; and we, following his wise example, instead of reckoning upon so many bushels per acre as the future increase in produce from steam ploughing,

might wait until a few harvests shall have actually measured the additional yield for us, in the bushel and the weighing-machine, and meanwhile confine our estimates to the proved economy of performance. But simply to chronicle realized results is not the whole of our duty. Let us cast a glance a-head, and, by the help of sound reasoning from admitted facts, proclaim the approach of changes in farm practice which we may descry upon the horizon of the future. No advance is likely to be made by men whose eyes are concentrated upon the present, to the entire neglect of possible and probable improvements; while undoubtedly great things are to be looked for as the consequence of a general feeling of expectancy and a due comprehension of the capabilities lurking in means which may be as yet comparatively new and undeveloped among us.

In steam culture, every one, of course, perceives the benefit to the farmer of having work done at a lower cost. Many people can also understand that a great national advantage may also accrue. The work which can be placed in the hands of the steam engine comprises the ploughing of furrow-slices, and the breaking up (without turning over slices), which is now coming into favour, just as it was in the old Roman days; and this substitution of steam for horse labour may save on light land one-fifth, on heavy land one-third, of the consumption of food, which might be converted into beef and mutton, instead of into horse-flesh that Swedish epicures cannot make savoury to us. Now, it so happens that the point of advantage in steam culture which is of least importance has had most prominence given to it—we suppose because of the ease with which it can be estimated and appreciated. The cost of the work is always a main point in public trials; but, in fact, the expedition or rate of performance is of incomparably greater consequence. When steam began to spin, he kept as many spindles going in a single house as a whole city could previously find feet and fingers for. And though a similar proportion of increased rapidity is impossible in agriculture, expedition is the greatest merit of the steam plough and grubber, however difficult it may be to assign a specific value to it. Owners of steam-cultivating machinery find that they get through a quantity of work as it comes in flushes at certain times of the year, which it would ruin a farmer to keep horses enough for through the remainder of the year. And this forwardness of work is equivalent to a certain increase of produce. Then the depth and perfection of the tillage not only render fewer operations necessary, but improve stiff soils so much that the character of the ground becomes changed, and great augmentation of yield is undoubtedly thus secured. Dr. Voelcker says of the

Woolston system: "Personal inspection of Mr. Smith's farm has convinced me that his plan of smashing-up the top soil, subsequent ploughing into ridges, and subsoiling between the ridges, sufficiently covers and mixes the manure with the soil. In my opinion, Mr. Smith's plan of treating his land is decidedly preferable to spade husbandry when it has to be carried out on a large scale; and I am convinced that steam cultivation, when properly carried out, will tend to increase the produce both of corn and roots in a surprising degree. . . . Putting up the land into ridges before the frost sets in, and subsoiling between the ridges, completely alters the character of the clay land; and many heavy soils will yield abundant crops with scarcely any manure, when due care is bestowed upon the mechanical preparation of the land."

But letting alone the increase of cropping, what a wonderful economy there is in the mere tillage operations required! Mr. Smith has a double-cylinder eight-horse engine to cultivate his little farm with, and so can seize the most favourable opportunities in the intervals of bad weather for getting his cultivation done. Still, he is under the disadvantage of having the expense of the machinery laid upon a small area of land. His tabular statement of costs and quantities shows that on the heavy land the seed-beds for seventeen crops require thirty-nine operations (including horse as well as steam-work), at an average cost of 10s. 10d. per acre for each crop. On the lighter land the seed-beds for twenty-six crops require forty-nine operations, at an average cost of 8s. 4d. per acre for each crop. That this is incomparably below the expense of seed-beds obtained by horse-labour, without steam-culture to assist, is known; but Mr. Smith places the matter in a very striking light, by giving fair estimates of the cost involved in ordinary horse-power farming. He shows that, on heavy land, eighteen operations are required for the seed-beds of seven crops, at an average cost of 21s. 4d. per acre for each crop—just double the expense of the Woolston system. And on light land eleven operations are requisite to prepare the seed-beds of four crops, at an average cost of 12s. 3d. per acre for each crop—one-half more than by the Woolston system. We think the heavy-land operations of ordinary farming are under-stated rather than made too much of; so that, in our opinion, the gain by the steam-tillage is more than a saving of one-half the expense now incurred by the clay-land farmer in preparing for the drill. In making Mr. Smith and the Woolston system the illustration of our article, we only regret to hear that this gentleman and his agents, the Messrs. Howard, have sued for a separation.

GREATEST NATIONAL EVIL.

THE SYSTEM OF LAND OCCUPANCY IN BRITAIN INCOMPATIBLE WITH IMPROVEMENT:

There are few minds able to compass the accumulative amount of a continued operating influence in one direction, and still fewer who will listen to the exposure of an evil, however important, which runs counter to their pride and prejudice. What I have here to state regarding the want of protection to property, capital, skill, labour laid out in the improvement of land, will be listened to—perhaps pretty well understood—by the farmers of Britain; but the landlords who have the power to remedy the evil, who are the doers of the

evil, in many cases not dreaming of the magnitude of the mischief that results from the present system, will think it overstated—will not have their eyes opened to the baleful effects, in a national wealth and national strength point of view—an evil, too, which they may selfishly not think their interest to redress. Such being the case, and the injured farmers helpless, I bring the subject to the bar of public opinion, for the people's verdict, in the hope that public opinion may have an impression. Still, in every class there are good men and true,

open to reason and justice, and to those of the landlord class I also appeal.

I feel here disposed to wander a little wide from the subject, to point out the importance of exporting manufacturers and great capitalists being resident in a country, as is the case of Britain—what may be termed primary sources of wealth; how that there is primary and secondary (and I may add tertiary) industry: instance a rich mine, or exporting manufacturing city, producing agricultural prosperity, and a numerous agricultural population, around it; and the mine becoming exhausted, or the manufacture declining, that the agriculture, and agricultural population, generally sinks *pari passu*. Thus, rich consumers at hand is everything to agriculture, where the produce is most of it bulky, of expensive carriage, or perishable, so as not to bear distant carriage. Need I further mention that another or third industrial class follows the primary and secondary—bakers, tailors, teachers, doctors, &c.—still more dependent than the agricultural, as their industry is still more locally limited. The high enrichment of the soil, and dense rural population of the adjacent country, is of great importance to the prosperity and health of the manufacture-exporting city, furnishing to the city in return rich consumers at hand, and in recruiting the naturally declining city population with the fresh blood and stamina of a country-bred race. It thus follows that the enrichment of our soil is everybody's business; that a deep debt of gratitude is due by our landlords to our exporting manufacturing city, and mining population, who have doubled the value of the British land, compared with that of the Continent; and, above all things, that no system of land occupancy greatly inimical to agricultural advancement ought to be tolerated.

As science in farming extends, the amount of capital required by the farmer is always increasing; in fact, is coming, on inferior soils, almost to equal the fee-simple of the land, impoverished as it usually is at tenant vacating, where a lease has existed. Expediency and justice demand that the British people should reap the full benefit of the capabilities of the British ground for improvement. Reason demands that the British land should be opened up to the full influence of British capital. Utility demands that the soil may be fertilized as far as, from its position (vicinity to a large and wealthy population), its enrichment would return a fair profit upon the outlay. Need I mention that the outlay can be directed to permanent improvement, as well as for shorter periods? It is strange, but not the less true, that Legislative assistance should be required to protect the British farmer, not from the plunder-loving French soldier, but from the British landlord. No sooner does the tenant expend capital in improving the landlord's ground, than the rent is raised to him, or at least may be (in many cases is raised): acting equally as a preventive of outlay. Under this wretched thrall to remove at six months' warning, the English farmer's policy is to take as much as possible out of the land, and put as little as possible in. That the farmer should expend money in improvement, under this inausufferable bondage, where another man has power at any time to expel him by a word or dash of his pen, is hardly to be expected. To lay out money on the land under such shameful dependence is naturally hateful to the tenant, from a sense of the injustice, even to the extent of self-injury, and not a tithe of the capital that would be invested, under a secure tenant right, is invested. No capitalist of spirit would submit to such a degrading position. What is needed is, a right to the improvement and enrichment of the soil the tenant shall effect, in case of removal, and the yearly rent to be fixed at a certain number of bushels of grain per acre; and should circumstances ensue to render the farm more valuable, that the landlord receive the benefit.

The want of a tenant's right to improvements made by him represses agriculture in England a hundred times over all that our agricultural societies, prize competitions, ploughing matches, &c., can forward. The system of procuring Government assistance to landlords, in draining, is only a clumsy and expensive way of doing that which the tenant, protected by tenant right, would himself do much better. Nothing can compensate, nothing can ward off the blighting influence of insecurity, whether as affecting skill, industry, or outlay of capital. The stimulus of security to reap the fruits of his labour being wanting to the tenant, all their adventitious schemes of encouragement, their artificial forcing, will not avail—cannot achieve impossibilities—cannot alter a law of nature. Protection of property is protection of life, or rather life itself. The want of it, in the case of capital, &c., laid out in agriculture, has, I have no doubt, prevented millions from existing in Britain; and these of our most robust, healthy, and happy population.

Even in Scotland, where leases are given, things are not ordered much better. There the farmer receives the land at entry in a very exhausted state, so much so that one-half of his lease of nineteen years is spent in restoring some degree of fertility, again to be exhausted in the last half, in order to recover the capital he had found necessary to lay out during the first half. Under this system of alternate periods of fertilizing and exhausting of the soil, much capital is disadvantageously employed, and in a great measure wasted, compared to what it would be in a rational continued process of enrichment of the land. The want of tenant right to improvement of the soil, under the English system of no lease, prevents the process of fertilizing being heartily entered into. The Scots system alternately creates and destroys.

In taking a parting and comprehensive view of this most important subject, we see the capital of the British empire prevented, by the want of security, by the want of a tenant-right, from being directed to the improvement of the British land, and so driven out of the country, to very precarious foreign investment, when it might most profitably, and more securely, be invested at home. We see that the energies of the farmer are not called forth by natural competitive selection; we find the farmer fettered, degraded, in complete dependence upon the will of another, who can at any time drive him from his home, and piratically seize upon any improvement he has made in his farm. We see the manure of the country, augmented by so much foreign food import, which, rightly directed, would render Britain the richest soil in Europe, swept away, in United States fashion, by our rivers, defiling their purity, destroying our river fisheries, and also poisoning or asphyxiating our riverside population as well as the fishes. We see our land, instead of being gradually enriched in soil, and the soil also doubled in depth (as, were the shackles to improvement removed, it would be), retained in an exhausted and unproductive condition—not allowed to be enriched, I am ashamed to state, by the grasping desire for despot power of a landlord class. Need I hint that conveyance of produce from foreign is becoming every year more facile? Hence there is a necessity for everything repressive of improvement in home agriculture being removed.

I intended to have closed here, but the magnitude and flagrant injustice of the evil—the vast national injury—force me to proceed. I am anxious that the landholders should view this subject aright—impartially view it: myself cultivating my own lands, and my sons cultivating their own lands, I speak impartially. In a civilized country we ought no doubt all to be dependent upon one another; kindly, but not despotically dependent; not crushingly, not destructively dependent. No class ought to have despotie

power over another—no indirect slavery; every one exerting himself for the general, as well as the individual, or family good. We ought not to be as brute animals and plants are—the strong trampling down the weak. We have a moral sense, a knowledge of good and evil, to direct us (of which we may term the *principles* of Christianity the simple embodiment), and he who is not so actuated is a mere brute. Every thing opposed to our agricultural prosperity, to the general good, should be put down—quietly put down. If it is not, it will be, some time, unquietly; or the British race will go down.

We are not singular in our mischievous land system. It would seem that the landlords were the bane of the earth's fertility all the world over. In the East Indies, as was wont also to be in Ireland, there are two sets of landlords—the primary, and secondary or middlemen—who have together so ground down the farmer, that the amount of rental has been in many places raised to three-fourths of the whole produce. Hence, from the absolute poverty of the farmer, and insecurity, the land is reduced to the lowest pitch of exhaustion; and the means of irrigation, so necessary in arid seasons, once so extensively pursued, allowed to fall into ruin. Of this wretched condition of the Indian farmers—the most grinding indirect slavery, and agriculture going to wreck—the present terrible famine in the north-west provinces is the result. Again, in the United States the cultivating landlords are the destroyers of fertility. When the forest is cleared away, there generally exists a foot or more of fine black mould. The possessor subjects this to the most severe treatment; crops it in the most exhausting manner for some 15 years; not unfrequently driving out his manure, in winter, upon the frozen river, to be got clear off without perceptible defilement in the spring, by floatage when the great freshets come down. (Our city system defiles the rivers all the year round). The result is, that in the course of some 15 years, the whole vegetable matter in the soil, the chief principle of fertility, is exhausted, and only a poor yellow or reddish earth remains, not worth culture.* The fertility-destroyer upon this enters upon the forest anew, again to commence his process of exhaustion, even more perfectly carried out than is done by the Scotch farmer towards the end of his lease. At the Cape the landlord-cultivator adopts a different system. Too indolent to drive out his manure, or not having in most cases a river near, he, when his manure has accumulated in hills around him, removes his dwellings and homestead to some other place of his estate. Need I mention here that the farmer-system of culture, in an old densely-peopled manufacture-exporting country, more especially where estates are large, is economically much more calculated to be productively-advantageous than landlord culture. The landlord in this case, where land becomes so valuable, is too rich, too much disposed to luxury and to act the great *seigneur*, to be inclined to attend industriously to the important minutiae of agriculture. All that is wanted is, to give the farmer freedom to act for his own and his country's good.

A healthy condition of the land occupancy is incomparably the most important object in social economy. Is it to be endured that the wealth of the British Empire, the vigour of the British race, should suffer from this ignoble taste of our landlords? I see no reason why they should not improve in taste—why they should continue to act the paltry despot; aware, as they profess to be, that crushing despotism—that want of protection to property—is antagonistic to industrial prosperity. We see in consequence of this intolerable bar to agricultural improvement, that the out-door working population of the country, where only the stamina of race can be upheld, are very much less in numbers to what they would be

under protection to property invested in agriculture, in a continued course of land enrichment, when two sheaves would be produced for one, and the out-door working population two for one. On the contrary, we see the manufacturing in-door population increasing rapidly from year to year. To what is this to lead? A degeneracy of the home British race, and decline and fall of the home British Empire.

Numbers of our landlords are kind and generous in a high degree—greatly improved within the last age: yet still we see no prospect of an improved system of land occupancy—no protection to property invested in the permanent improvement of the soil. Without this their kindness and generosity is of small avail; only serves to bolster up this "*greatest national evil*." Tenant-right to improvement of the soil, and nothing else, can place British agriculture upon a sound basis.

Classes of men in their corporate capacity are said to be completely selfish; yet I hope these principles will not apply to the landlords of Britain. I have no class prejudices, but from my position I cannot brook that our landlord class should be supposed dead to patriotic feeling, destitute of any desire to forward the improvement of their country and race—that they should have receded back (as a body) to the lowest man-savage of the stone or paradisaic period, without a moral sense, like unto the other animals of the forest, although now and then a specimen of such may be appearing. I hope and trust that, as a body, they participate in the moral sense attained by civilized man, when he rose to the knowledge of good and evil, strangely travestied by Rousseau, and the poetic imagination of the east, into a *fall*, and the wilderness into a paradise. The present era is opening up a new order of things, in sentiment, as well as judicious or prudent necessity, which may lead to reform of this noxious system. In a neighbouring country we know what took place in consequence of the defects of a landlord class, and the want of timely reform, as told in our infant rhymes.

"Hurly Burly brak its hands,
Ran through all the King's lands;
The King and a' his men
Couldna haud Hurly Burly agen."

Should the improvement of the British soil continue to be prevented by this very injurious occupancy, and the farmer class, comprising about half of the middle classes, kept in slavish dependence, as exists in the greater part of England, it is not easy to say what the result may be. I am aware of the benevolence of many of the landlords of England, and the well-being, though dependence, of their tenantry; but the system is naught, and does not call forth the energies of the tenantry. A law of protection of capital invested in land improvement, a tenant-right to a tenant-created wealth, together with the greatly-increased emulation and competition to excel, which would ensue, would very soon put a different face upon the British Isles. The increase of depth and richness to which the British soil may be brought in this climate, where soil is more accumulative than in arid hot countries, and where so much food and manure is imported, it is impossible to estimate.

I hope that a subject, beyond all others important to the prosperity of the British Empire and race, will meet the most careful consideration of the Legislature, and the best practical means be adopted of placing agriculture upon an improving basis. It is in many things easy to point out defects and to destroy, but it is not easy to correct the errors into which

* From the evanescent nature of the black mould which has collected under the forest-shade, to preserve it would require the most careful treatment. The exhaling power of the ardent summer sun in the United States being very exhausting to the vegetable-collected matter in the soil, when exposed by ploughing in a naked state.

society has fallen—the greater the more difficult to reform. Having described the evil as it now exists, it may be deemed my duty to propose a remedy, and I shall attempt briefly to do so. Things can only be put to rights by a new social organization (which in country places is much needed in other respects) of country magistrates, similar to the *prud'hommes* of our neighbours. Say in every three, or if small, four country parishes, that six unpaid magistrates be elected yearly, resident in the parishes—two by the landlords, two by the farmers, and two by the other classes—who should have the deciding of all tenant-right claims. The six magistrates to elect a seventh. These magistrates could also act as conciliators to settle disputes amicably, and as far as possible prevent litigation within their district. Something of the same nature might be carried out in cities, to prevent, as far as possible, strikes and litigation.

No land-occupancy system can be devised to be perfectly just in all cases, and at the same time easily workable; but a near approximation could be reached. The land would require to be arranged in classes 1st, 2nd, &c., say up to 6th or 8th, and each class valued or estimated at a certain amount of grain, worth per acre per annum of rent. Then if a tenant should raise the quality of his land from one class to the next above it, that he should in case of vacating the land receive say two-thirds of the increase, and if to the second class above it, say three-fourths of the increase rent it is worth, as a tenant-right. At the same time, in the case of the improving tenant remaining, should the landlord desire to raise the rent, that it shall only be raised in the first case one-third, in the second case one-fourth, and if to a third upward one-fifth of the improvement, and so on. Of course the tenant would deserve the whole rise of value he had effected in the soil, and no generous landlord would so interfere. But we cannot altogether ignore the landlord's interest in his own land. In case the landlord discovered any of his tenants lowering by bad management the status of his farm, the landlord could expel him, and give the ground to another; and if the expelled tenant have funds, he ought to be made accountable for the damage. I merely give this as a slight sketch of what might be a judicious arrangement. It would apply equally in the case of a lease at the expiry of the lease, or of a tenant-at-will.

There is a strong industrial principle and desire to improve and do right in the human mind, especially in the steady well-doing Anglo-Saxon race. This no doubt urges on the English farmer in improvement, even without a lease or security. But capital cannot seek, cannot flow into this most fertile reproductive field; the farmer cannot obtain capital, or obtained, cannot largely invest without a lease or security by a tenant-right—perhaps there ought to be both. And surely the English landlord is of too high a mind to wish to retain his fellow-subject in so dependent a situation—to desire to have it in his power to take advantage of this improvement, instinctive disposition, and rob the bee of the honey he has made. On the continent of Europe, to the eastward, the farmer rent-paying class is not generally developed, and the landlords cultivate their own ground. It is not uncommon for a proprietor to have 300 cows, and, I have known, seventy ploughs. But this system is not to be desired. A division of labour is necessary; the whole energies devoted to one purpose; a farm not too large; a necessity for exertion called forth by competition. Landlord farming does not call forth this, and, except in the case of a *model* farm, cannot be advantageous. Besides, landlords have other duties—the direction of political and social affairs, more especially in the case of our privileged order of legislators, and indeed all large land-

holders are, from the influence of property, virtually so privileged.

To conclude: A very important advantage of protection of property invested in agriculture would be, that very large farms would disappear. Large farms, or monopoly of a number of farms, is of injurious tendency. A farm of four or five ploughs can, at least ought, to be able to support and well-educate a family, and thus serve as the best possible brood-ground for physical and mental strength to carry out the unparalleled present advancement in the organism man (our Cobden is the son of a farmer). Besides, a very large farmer, different from a farmer of moderate extent, is often not a home-keeping family man, frequently a worthless bachelor; therefore, in the present position of Britain, whose vocation is to people the waste portions of the earth with the foremost race of man, not a good subject. I cannot but regard a British farmer, under the present mischievous system, as a mere soil-robber—driven by the despotism of landlords, as the Italian brigands in the territory of the Church by the despotism of priests, to robbery. It is protection to property that is wanting in both cases. Large farms are the children of non-protection. Were protection given, the farmer would become more locally bound; would find that he could employ his capital more profitably in enriching a small farm than in robbing large ones. Protection to investment of capital in the enrichment of land is above all things required. Its opposers can only be regarded as the greatest enemies of mankind.

Gourdie Hill, Errol,

PATRICK MATTHEW.

Carse of Gourie, March 12, 1861.

DURHAM COUNTY SHOW OF STALLIONS.

This exhibition was held at Durham, and was very largely attended. There were thirteen entries of blood horses, and eight of cart horses; the prize in either class being £15. Thomas Parrington, Esq., hon. sec. of the Cleveland Agricultural Society, of Normanby, near Redcar; John Booth, Esq., of Killerby, near Catterick, one of the noted cattle breeders; and J. M. Patterson, Esq., of Norwood, near Gateshead, acted as judges. The horses shown in the first-class were:—

Mr. J. Shield's Llammas Day,
Mr. J. Lightfoot's Greatheart,
Mr. J. Bowes's Graculus Esurieux,
Mr. R. Wright's Sir Walter Scott,
Mr. J. Smurthwaite's Tunstall,
Mr. Hymer's Bondholder,
Mr. J. Brown's Farnham,
Mr. G. Hall's Pilgrim,
Mr. Hutchinson's Motley,
Mr. J. Metcalf's Young Voltigeur,
Mr. W. White's Homoeopathist,
Mr. Nixon's Lancewood,
And another

Farnham, who has won on several previous occasions, was declared the winner, although the prize was very severely contested with him by Bondholder, a horse which appeared to have very numerous admirers. Nonpareil took the prize for cart stallions; he has been a winner on three previous occasions. He had to compete with Wearmouth, Hero, Matchless, Nafferton, Wallace, Freeman, Netherton, Young Blyth, and Benwell Hero. Farnham has also won a prize at Bishop Auckland this Spring.

PRINCIPLES OF MANURING.

The Rothamsted experiments with different manures on permanent meadow land described.—Ammoniacal manures used in successive years shown to be conducive to a bulky but coarse pastoral herbage.—Phospho-calcareous manure, conjointly with salts of potash, soda, and magnesia, shown to be favourable to the growth of a more nutritious, although less abundant yield of grass.—The futility of the chemical analysis of plants, in estimating their economic value, illustrated.

Everyone acquainted with the husbandry of pastures is aware, that the close sward which carpets the meadow or permanent grass-field is various in its botanical composition, and that amongst the many species of plants falling within the term pastoral-herbage, great diversity of nutritive or economic value exists between kind and kind. Hence, therefore, it would have been idle here to expatiate on points so trite as these are, were not some preliminary consideration of them necessary to the argument about to be pursued: and having offered this short apology for entering, as we briefly shall, on this common-place subject, we proceed to remark that no grass-field, whether kept for grazing or mowing purposes, can be deemed a prime one, which does not contain a decided preponderance of individual herbs which in the technical language of botany belong to *gramineous genera*. Associated with these there ought also to exist a considerable minority of *leguminous* plants. Of the former class, rye-grass, the poas, fescues, cocks-foots, &c., are representatives. The clovers, birds-foots, vetchlings, &c., belong to the legumens. But besides these two prevailing orders, most grass-lands contain a greater or less intermixture of what may be called an undesirable herbage, except when existing in decidedly less proportion. To this class belong the narrow-leaved plantain (rib-grass), yarrow, and crows-foot ranunculus. Everything else may at once be consigned to the category of weed.

1. *Of the Grasses*.—Now, although these are to be regarded as the chief generic constituents of a good pasture or meadow vegetation, yet it is no less certain that of the total number of species indigenous to Britain, numbering about 130, fewer than thirty-five are recognised as coming within the pale of grass-husbandry; and of these no more than ten or eleven are deemed choice. The following table, chiefly compiled from the article on "Grasses" in "Morton's Cyclopedia of Agriculture," exhibits the names, and relative positions in point of quality, of the domesticated species:

TABLE I.

CHOICE AND INFERIOR SPECIES OF PASTURE GRASSES.

CHOICE SPECIES.	
Foxtail-grass	<i>Alopecurus pratensis</i> .
Rough cocksfoot	<i>Dactylis glomerata</i> .
Hard fescue	<i>Festuca duriuscula</i> .
Tall fescue	" <i>clatior</i> .
? fescue	" <i>heterophylla</i> .
Meadow fescue	" <i>pratensis</i> .
Perennial fescue	" <i>perenne</i> .
Rye grass	<i>Lolium perenne</i> .
Timothy or catstail	<i>Phleum pratense</i> .
Wood meadow grass	<i>Poa nemoralis</i> .
Small "	" <i>trivialis</i> .
Smooth "	" <i>pratensis</i> .
Annual "	" <i>annua</i> .

For Water Meadows.

Fiorin grass	<i>Trisetum flavescens</i> .
Manna grass	<i>Agrostis stolonifera</i> .
"	<i>Glyceria aquatica</i> .
"	" <i>fluitans</i> .
"	<i>Phalaris arundinacea</i> .

INFERIOR SPECIES.

Sweet-scented vernal grass.	<i>Anthoxanthum odoratum</i> .
Crested dogstail grass	<i>Cynosurus cristatus</i> .
"	<i>Milium effusum</i> .
Tall oat grass	<i>Arrhenatherum avenaceum</i> .
Yorkshire fog	<i>Holcus lanatus</i> .
Bentgrass	<i>Agrostis vulgaris</i> .
"	<i>Aira cæspitosa</i> .
"	<i>Brachypodium sylvaticum</i> .
Great fescue grass	<i>Festuca gigantea</i> .
Creeping "	" <i>rubra</i> .
Sheeps "	" <i>ovina</i> .
"	<i>Holcus mollis</i> .
"	" <i>pratensis</i> .

Not uncommon as Weeds in inferior pastures.

Quaking grass	<i>Briza media</i> .
Brome grass	<i>Bromus mollis</i> .
Meadow oat-grass	<i>Avena pratensis</i> .

2. *Of the Leguminous species of Pasture-plants*.—Altogether the British species of this botanical order are about eighty in number, comprising the clover (16 species), bird's-foot, bird's-foot trefoil, medic, tare, vetch, sainfoin, &c.; and we now give

TABLE II.—Showing the Pasture-species of Leguminous Herbage, arranged in Choice and Inferior classes.

CHOICE SPECIES.	
Perennial red clover	<i>Trifolium pratense</i>
Dutch or white clover	" <i>repens</i>
"	" <i>hybridum</i>
Medic	<i>Medicago lupulina</i>
Bird's-foot trefoil	<i>Lotus corniculatus</i>
Greater "	" <i>major</i>

INFERIOR SPECIES.

"	<i>Trifolium filiforme</i>
"	" <i>minus</i>
Yellow vetchling	<i>Lathyrus pratensis</i> .

3. *Of Miscellaneous Pasture-Plants*.—These belong to various botanical orders, but they may be tabulated together.

TABLE III.—Showing the species of Miscellaneous Pastoral Herbage, arranged in Choice and Inferior species.

CHOICE SPECIES.	
Rib-grass	<i>Plantago lanceolata</i>
Yarrow	<i>Achillea millefolium</i>

INFERIOR SPECIES (WEEDS).

Caraway	<i>Carum carui</i>
Sheep's sorrel	<i>Rumex acetosa</i>
Catchfly	<i>Silene</i>
Crow's-foot or buttercup..	<i>Ranunculus</i>
Speedwell	<i>Veronica</i>
Bedstraw	<i>Galium</i>

The purpose for which the foregoing tables are given, will evolve itself in the sequel; and we now enter on what will form the text of this paper, namely, the "Report of Experiments with different Manures on Permanent Meadow-land." By J. B. Lawes, F.R.S., F.C.S., and Dr. J. H. Gilbert, F.C.S.—*Roy. Ag. Journ.*, vol. xix., 1858.

The period of the trials included seasons 1856, 1857, and 1858. The soil is a somewhat heavy loam, with a red clay subsoil, resting upon chalk; and although not artificially, is very well naturally drained. The land selected comprised about six acres of the park, which had been under permanent grass for more than a century; and the general mode of previous treatment appears to have been to manure occasionally with farm-yard dung, road scrapings, and the like, and sometimes with guano or other purchased manures. One crop of hay was removed annually, amounting in weight to from 1½ to 2 tons per acre; and the second crop was always eaten off by sheep. The trial plots were 17 in number, and of these nine of half an acre each and four of one-sixth of an acre each were appropriated to manuring with artificials, two plots of a quarter of an acre each were manured annually with farm-yard dung, and other two of similar size were continuously unmanured. The following table contains the results obtained from seven of the plots selected by the experimentalists themselves, as more especially illustrative of the general conclusions deducible from the investigation.

TABLE IV.—PRODUCE OF HAY (PER ACRE).									
Plot.	Nos.	MANURE (PER ACRE).	Annual produce.				Average annual increase by manure.	A average annual increase by manure.	
			1856.	1857.	1858.	Average of three years.			
1 & 2	4	Unmanured, mean of the two Ammoniacal manure, viz. { 200lbs. sulphate of ammonia..... 200lbs. bone-ash..... 150lbs. sulphuric acid } superphosph. of lime.... 300lbs. sulphate of potash..... 100lbs. " of soda..... 100lbs. " of magnesia.....	t. c. lb. t. c. lb. t. c. lb. t. c. lb. t. c. lb. t. c. lb.	1 1 81 1 4 36 1 6 4 1 4 3	1 15 108 1 13 78 1 15 62	1 15 8 0 11 5	—		
8		Mineral manure, viz. { 100lbs. " of soda..... 100lbs. " of magnesia.....	1 10 69 1 12 82 1 16 50 1 13 30 0 9 27						
10 {		Mixed ammoniacal and mineral manure, the quantities being the same as those of Nos. 4 and 8 united	2 16 91 2 17 38 3 4 4 2 19 44 1 15 41						
13 {		Mixed ammoniacal and mineral manures, the same as in Nos. 4 and 8, but the ammoniacal salts doubled in quantity	3 2 26 3 1 108 3 7 4 3 3 83 1 19 80						
16 {		Farm-yard dung alone (14 tons)	1 15 110 2 7 36 1 17 20 2 0 27 0 16 24						
17 {		Farm-yard dung (14 tons) and 100lbs. each sulphate and muriate of ammonia	2 4 81 2 13 72 2 7 56 2 8 70 1 4 67						

TABLE IV.—PRODUCE OF HAY (PER ACRE).

plot No. 16, manured with 14 tons of farm-yard dung in each year, with the unmanured plots Nos. 1 and 2, an increase due to the manuring is seen of 16 cwt. 24 lbs., a return very far, indeed, from adequate to repay the operation. But in this, as in other instances of Rothamsted experimental investigation, mere pecuniary considerations are disregarded, the sole object of all of them being to determine only the philosophical effects of the manurial substances; in other words, to ascertain what influence they had in promoting the growth of cultivated vegetation, or the reverse.

Now, in the second place, it were simply a truism here to remark, that different manures very differently affect the *quantity* of yield in the crops to which they are applied. This is known to every one. But no less certain it is, although too little considered, that the *qualitative* influence of various manurial substances administered to the various constituency of pastures—in other words, the tendencies of different kinds of fertilizers to control the relative proportions of choice and inferior vegetation in grass land, is a subject which has never received anything like adequate investigation. Many striking instances could be collected from the journals, to show how great, for good or evil, this qualitative influence is. To enter on them at present, however, would be to transgress our limits, and we shall be content to expatiate on those only which constitute the differential results of the experiments under consideration, and which, in fact, are highly illustrative of this important subject. To this end, one of the tables presented by the experimentalists, No. IX. of part second, vol. xx., p. 250, forms an invaluable aid, expressing as it does, not only the names of the different species of plants which occupied the ground at the outset of the trials, but the per centage proportion in which each of these aboriginal species prevailed. Nay more; in each of the seven selected instances transferred to our prior table, No. IV., the same classified enumeration was made in the last year of the experiments; and thus, by comparing the manured with the normal unmanured species, it was ascertained, as, indeed, was to be anticipated, that mere gross quantity of produce not alone was differently affected by the different substances exhibited as dressings; but that the relative per-centage proportions numerically examined between species, and species was very variously controlled. Now this being so, and it being also true, as already noted preliminarily, that all the vegetable denizens of the pasture, field, or meadow, are not of equal economic value, it is essentially important to know what the behaviour of each kind of the experimental manures was, in promoting or repressing the growth of the good or bad herbage; and without further preface there shall next be presented a table of the constituent members of those tribes which clothed the ground in its *normal*, i. e., *unmanured* condition.

TABLE V.—Showing the constituent Plants of the Experimental Ground in its *natural* or *unmanured* condition.

INDIVIDUALS FALLING UNDER THE DENOMINATION OF CHOICE SPECIES.—See before (Table I)

1. Grasses.

- Perennial rye-grass.
- Smooth meadow-grass.
- Rough cocksfoot.

2. Legumens.

- Perennial red-clover.
- Birdsfoot trefoil.

3. Miscellaneous Species.

- Rib grass.
- Yarrow.

Here, on comparing firstly the annual products of

INDIVIDUALS FALLING UNDER THE DENOMINATION OF INFERIOR SPECIES.—See before (Table I.)

1. Grasses.

- Sweet-scented vernal-grass.
- Crested dogtail.
- Oat-grass (*Arrhenatherum avenaceum*).
- Yorkshire-fog.
- Bent-grass.

2. Legumens.

- Yellow vetchling.

3. Miscellaneous Species (weeds).

- Carroway.
- Sheep's-sorrel.
- Catchfly.
- Crowsfoot
- Speedwell.
- Bedstraw.

From this enumeration it is seen that of the 18 species of grasses set down in our previous table (No. I.) as choice, only three existed anterior to the experiments in Rothamsted Park; whilst of the 16 species ranked as inferior no less than eight had representatives there. Of 5 good forms of legumens (see Table II.) two only were present in the unmanured plot. Of miscellaneous herbage eight species were indigenous to the ground, and all of them belonged to the class of weeds save two. Hence, then, the initial herbage of these experimental plots was manifestly of a very inferior quality; and thus it will be all the more interesting to learn whether any, and what influence, ameliorative or otherwise, was traceable to the several kinds of manure used. Accordingly, this question we will now endeavour to solve by a series of tables deduced from those furnished by the experimentalists, beginning with a tabular comparison between the results of the plot manured with *farmyard dung* alone and those of the plots *continuously unmanured*. At first the gramineous products only will be considered. The headings "Choice species" and "Inferior species" are explained by the prior table No. I.

TABLE VI.—Showing the Gramineous Produce of the Plot manured with Farmyard Dung alone, compared with the Produce of the Unmanured Plots.

	GRAMINEOUS PRODUCE.		
	Choice Species.	Inferior Species.	Totals.
	Cwt.	Cwt.	Cwt.
Mean annual produce of plot manured yearly with 14 tons of farmyard manure alone	22	13	35
Mean annual produce of plots 1 and 2 continuously unmanured	6	12	18
Increase of choice species due to the manure ..	16		
Increase of inferior species..	..	1	
Total increase	..	..	17

Thus, then, it is here shown that the effect of farmyard manure on the Rothamsted soil was not merely to increase the yield of grass, but very greatly to improve its quality by increasing the proportion of good grasses and diminishing the ratio of bad kinds. The species so encouraged were rye-grass and smooth meadow-grass.

Those repressed comprised the innutritious and unpalatable *Holcus lanatus*, or Yorkshire fog. The experiment with mixed mineral manures alone will next be examined.

TABLE VII.—Showing the results of the experiment with Mixed Mineral Manures, in contrast with those of the Unmanured Plots.

	GRAMINEOUS PRODUCE.		
	Choice Species.	Inferior Species.	Totals.
	Cwt.	Cwt.	Cwt.
Mean annual produce of plot No. 8 manured with mixed minerals alone	13	10½	23½
Mean annual produce of plots 1 and 2 unmanured	6	12	18
Increase of choice species by the manure	7		
Decrease of inferior species	..	1½	
Total increase	..	..	5½

Here also the influence of the manure was both quantitative and qualitative—the qualitative amelioration being, in fact, remarkably great, seeing that while rye-grass was largely increased proportionally, Yorkshire fog suffered in almost equal diminution. Moreover, when we come to examine the consequences on the leguminous vegetation of this plot, it will be found that the effect of the mineral substances experimented with in this trial was to excite the red clover—all but absolutely dormant before in the unmanured soil—into great vegetative activity.

The next table sets forth the particulars of the experiment with ammoniacal salts:

TABLE VIII.—Showing the Results of the Experiment with Ammoniacal Salts alone, contrasted with those of the Plot manured with Mixed Minerals.

	GRAMINEOUS PRODUCE.		
	Choice Species.	Inferior Species.	Totals.
	Cwt.	Cwt.	Cwt.
Mean annual produce of Plot No. 4, manured with ammoniacal salts only.....	14½	17	31½
Mean annual produce of Plot No. 8, manured with mixed minerals.....	13	10½	23½
Increase of good species... ..	1½		
Increase of inferior species		6½	
Total increase.....			7½

In the two immediately preceding manured instances (Tables VI. and VII.), it has been seen that, whereas, in the normal herbage of the unmanured soil, the inferior species exceeded the choice kinds, in these two former instances the relative prevalence was reversed—that is to say, the effect of the farmyard dung (Table VI.) and of the mineral manures (Table VII.) was, to elevate the good herbage into the majority, and to depress the bad into the minority. But now, with an ammoniacal dressing, the normal excess of inferior kinds was perpetuated, the effect on the leguminous herbs being actually to eradicate the best two of the three kinds indigenous to the soil—namely, the clover and birdsfoot

trefoil. Thus, then, the very interesting question is here raised: Were these circumstances to be regarded as peculiar to the ammoniacal manuring of grass land for three consecutive seasons? or were they only casual? On this inquiry the experiments remaining for examination are extremely instructive. They are three in number, and consist of one trial where farmyard dung was supplemented with ammoniacal salts, and other two where the applied mixed minerals also had the same kinds of ammoniacal substances in addition. These shall now be severally tabulated:

TABLE IX.—Showing the Results of the Experiment with 14 tons of *Farmyard Manure*, supplemented with 100lbs. each of *Sulphate* and *Muriate of Ammonia*, contrasted with the Results of the same Quantity of *Farm Dung* alone.

	GRAMINEOUS PRODUCE.		
	Choice Species.	Inferior Species.	Totals.
	Cwt.	Cwt.	Cwt.
Mean annual produce of Plot No. 17, manured with 14 tons of dung, and 100lbs. each of sulphate and muriate of ammonia	15	23½	38½
Mean annual produce of Plot No. 16, manured with 14 tons of dung alone	22	13	35
Decrease of good species, } from the ammonia used }	7		
Increase of inferior species		10½	
Total increase			3½

The unhappy consequences of supplementing home-made manure (which used alone had produced the most beneficial effects) with ammoniacal salts were, then, simply these: not only to increase the total yield no more than 5½ cwt., but to nearly double the proportion of poor herbage, striking off, at the same time, one-third part of the yield of the good kinds. The augmented species were those pests of the meadow, *Yorkshire fog* and *knot-grass*; the diminished ones were the pre-eminently excellent *rye-grass*, and the scarcely less valuable *smooth meadow-grass*.

TABLE X.—Showing the result of manuring with *Ammoniacal Salts* jointly with *Mineral Manures*, compared with the results of *Mineral Manures* alone.

	GRAMINEOUS PRODUCE.		
	Choice species.	Inferior species.	Total.
	Cwt.	Cwt.	Cwt.
Mean annual produce of No. 10, manured with 200lbs. each of sulphate and muriate of ammonia, jointly with mineral manures ..	26½	31¼	57¾
Mean annual produce of mineral manures alone ..	13	10¾	23¾
Increase of good species } from the ammoniacal } manuring .. }	13½		
Greater increase of bad } species .. }		20½	
Total increase ..			34

TABLE XI.—Showing the result of manuring with *Ammoniacal Salts* in doubled quantity, jointly with *Mineral Manures*, compared with the results of *Mineral Manures* alone.

	GRAMINEOUS PRODUCE.		
	Choice Species.	Inferior Species.	Totals.
	Cwt.	Cwt.	Cwt.
Mean annual produce of plot No. 13, manured with 400lbs. each of sulphate and muriate of ammonia, jointly with minerals ..	30¾	31	61¾
Mean annual produce of plot No. 8, manured with minerals only ..	13	10¾	23¾
Increase in quantity of good species from the ammoniacal manure ..	17¾		
Greater increase of inferior species ..		20¼	
Total increase ..			38

What, then, is the answer which these tables furnish to the question already put, whether there is reason to believe that the exhibition of ammoniacal manure is constitutionally characterised, by inducing a profuse, but coarse gramineous herbage? Why this, that *used alone* at Rothamsted, it was so; that *used with farm-yard manure*, it was so; that *with mineral manures* in one proportion of admixture, it was so; that *with mineral manures* in another proportion, the augmentation, good and bad, was equal; while, on the other hand, *farm-yard manure* and *mineral manure*, each administered *alone*, played the very reverse part, since they both discouraged the inferior, and signally fostered the choice kinds.

Let us next consider the experimental results of the various manurings on the leguminous vegetation of the experimental meadow; and, for the sake of brevity, the whole instances shall be comprised in one table.

TABLE XII.—Showing the Effects of the *Non-ammoniacal* and *Ammoniacal Manures* on the Leguminous Herbage.

MANURES.	Produce where no ammonia salts used.		Produce when ammonia salts used.	
	Choice species.	Infr. species.	Choice species.	Infr. species.
	cwt. lb.	cwt. lb.	cwt. lb.	cwt. lb.
1. <i>Manure containing no Ammoniacal Salt.</i>				
Mixed minerals alone ..	6 9	1 55		
Farm-yard dung alone ..	0 76	0 90		
2. <i>Ammoniacal Manures.</i>				
Sulphate and muriate of ammonia alone ..				0 86
Sulphate and muriate of ammonia jointly with minerals ..			0 0	0 0
Sulphate and muriate of ammonia in double quantity, jointly with minerals ..			0 0	0 0
Sulphate and muriate of ammonia jointly with farm-yard dung ..			0 25	0 70
3. <i>Unmanured.</i>				
Produce of the unmanured plots ..	0 80	0 53		

Here the evidence clearly shows, that in like manner as the inferior species of gramineous herbage were encouraged by the ammoniacal manures and the good kinds discouraged, the effect on the leguminous tribes was the same. On the other hand, the non-ammoniacal manures were eminently promotive of an improved leguminous vegetation. The purely mineral composition, in particular, had a very marked effect in fostering the growth of a considerable proportion of perennial red clover. In the normal condition of the meadow, this valuable member of good grass land existed in the limited proportion of only 1-5th per cent. of the entire produce. In the plot manured with minerals alone it was raised to nearly 18 per cent. On this circumstance the experimentalists have laid much stress, as being, in their opinion, a strong confirmation of one of their favourite theories, namely, that the mineral manures experimented with at Rothamsted are those specifically beneficial to all legumens as a botanical order in the vegetable kingdom, whether they be the pea, bean, tare, or vetch of tillage husbandry, or the clovers and trefoil of permanent grass land. But as respects the particular experimental instance in hand, the tone of original discovery in which it is commented on by the experimentalists, resolves itself into a thrice-told tale, since it is a fact, as already specially pointed out (see Table IV.), that under the ambiguous term "mixed minerals," which proved so efficacious in entitling the experimental plot, treated with these substances alone, to claim for its produce the palm of greatest qualitative excellence, *there was included upwards of 3 cwt. of superphosphate of lime*; so that in the course of the three years embraced in the trials, the land received at the rate of nearly half a ton per acre of this well-known promoter of all the best kinds of pasture vegetation. Considering how immediately active is the manurial element in phospho-calcareous substances rendered soluble by acids, whether it be the phosphatic constituent or the lime, the quantity of superphosphate here applied in three years is to be regarded, looking at immediate results, as equal or perhaps much more than equal to the usual quantity of raw bones (from one to two tons), once in ten or twenty years, so generally used to top-dress the grass fields in the best-managed pastoral districts of England. In Cheshire, says Caird, the almost immediate effect is "to cover the ground thickly with clover, trefoil, and succulent grasses, in lieu of the thinly planted and very innutritious pink pointed grass which previously occupied the soil." "Bones," says the late Duke of Portland, in describing his improvements in pasture land, "appeared so much to encourage the growth of white clover, that I had almost formed the opinion that it was superfluous to sow seed."

"Having now shown," says Mr. H. S. Thompson, in his admirable Essay "On the Laying down of Land to Grass, and its Subsequent Management," "that the farmer has to a great extent the power of deciding upon the kind of grass that he will grow, I must next remind him that great fineness of quality is inconsistent with large bulk; and that if he requires hay for sheep or horses for fast work, he must be content with a moderate amount of produce. Bearing this in mind, I would furnish him with this general rule: that when he wants quantity, he must use guano, nitrate of soda, soot, or other ammoniacal manure; and that when he wants quality he must use lime or bones" (*Journal Royal Agricultural Society of England*, vol. xix. p. 262). And again: "The last point to which I shall call attention is the improvement of pastures, and there is scarcely a farm in the United Kingdom on which this kind of improvement is not wanted. An outlay in bones or lime of £4 or £5 per acre would convert a

large portion of our second-rate pastures into good feeding land," (p. 263.) And again: "Should the land bear coarse strong herbage, which cattle reject, a dressing of compost containing a few bushels of bones per acre, especially if well soaked with liquid manure from a cattle-yard, will bring clover and fine herbage, and make the cattle graze it to the very roots of the grass," (p. 264).

Yet in the face of these, and many other equally authoritative dicta of practical agriculturists, the Rothamsted experimentalists are pleased to say that the application of bones is not recommended for general "adoption." Upon no grounds are they warranted in offering opinions in husbandry to the world, except such as flow out of their own experimental processes, and in as far as these bear on the use of that form of bone manure termed superphosphate of lime, they are eminently confirmatory of the general verdict in favour of bone manuring in meadows or pastures. Again, say the experimentalists, "the best artificial manures for grass-land are Peruvian guano" (which we neither admit nor deny, because it is not in the category of manures experimented on); "and nitrate of soda and sulphate (or muriate) of ammonia," which on the basis of the experimental results themselves we deny. 1st, because as respects nitrate of soda the trial was only for one year; and secondly because as respects the ammoniacal salts, the plain testimony is to consign them to the limbo of those manurials whose propensities are, when used in successive years, to encourage bad, and discourage good species of vegetation.

With regard to the voluminous chemical disquisition embodied in the published report, we believe we shall best convey an idea of its import by quoting the headings given in this part of the experimentalists' paper.

EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LAND.

- "Table XI.—Per centage of dry substance in the hay.
 XII.—Per centage of mineral matter (ash) in the hay.
 XIII.—Per centage composition of the ash, and quantities of the mineral constituents in the total produce, and in the increase by manure per acre.
 XIV.—Composition of the ashes of meadow hay, grown experimentally in different seasons.
 XV.—Per centages of nitrogen in the hay.
 XVI.—Per centages of woody fibre in the hay.
 XVII.—Collective view of the composition and description of the mixed herbage."

That the result of investigations such as are indicated by these tabular titles, almost always evolve an enormous amount of uncertain conclusion, is known to every one. We will give an instance of this, deduced from

No. XVII. vol. xx., p. 429, of the above enumeration.

From the second section of that table, headed "Composition per cent. in the dry substance of the Hay," it appears, that if the innutritious woody fibre of the produce of the plot No. 10, manured with *mixed minerals and ammoniacal salts*, be deducted from the other chemical results of the analysis, there remains a residual per centage of nutrimental elements amounting to

Calculated in like manner, the chemical results of the analytic examination of the produce of plot 8, manured with *mixed minerals alone*, gives of nutritive matters

so that, according to this, it is to be understood, that the several products of hay from these two differently-manured plots, were, ton for ton, of almost exactly equal nutritious, or feeding value. That this conclusion is preposterous is manifest from this simple fact, that, ton for ton, the yield of the non-ammoniacal experiment

No. 8 contained abundant red-clover, of which invaluable pasture-herb the produce of the ammoniacal trial No. 10 contained none; ton for ton, No. 8 contained more rye-grass than did No. 10; and it contained no single blade of Yorkshire-fog, whilst in No. 10 that opprobrious weed prevailed to the extent of 8 cwt. in every ton. Hence then, the exact similitude in analytical results derived from two samples of hay so widely dissimilar in economic quality leaves no room to doubt that, however accurately the analysis may have been conducted, and however true the result given, it can be invested with no instructive practical value. Indeed, in no point of view is it possible to discover wherein these analytical investigations can ever take up a position of general interest or utility, seeing that their ground-work was a very inferior product of meadow herbage, containing no white clover amongst the legumens, no foxtails, catstails, or fescues, and only one poa amongst the grasses; but plentifully contaminated with knot-grass, and overrun with that gramineous abomination in pastoral husbandry *Holcus lanatus*, or *Yorkshire fog*.

And now to conclude this series of disquisitions on Rothamsted experimental manuring, we sum up as follows: By the doctrines of this school of agricultural teaching three manurial specifics are more especially advocated as promotive of abnormal fertility—nitrogenous salts for the cereals and other members of the botanic order of grasses; phosphate of lime for the turnip plant; and mixed minerals for those leguminous tribes, of which clover may be taken as the type. As for the behaviour of nitrogenous chemicals with the corn plants, the history of the experiments has been seen to resolve itself into a palpable confirmation of Liebig's prediction—that any excess of yield procured at first by the use of special manures will surely be followed ultimately

by a corresponding amount of induced infertility. On the miscellaneous species of plants which constitute the vegetation of the meadow or pasture field, the effect of nitrogenous manuring has been demonstrated to be, to multiply greatly the worse kinds and to discourage or utterly exterminate the better. Passing next to the influence of phosphatic manure on the growth of the turnip, we have reminded the farmer that if, in like manner as at Rothamsted, the use of that substance is generally attended for a time with unequivocal productive effect, it nevertheless is undeniable that coincident with its wide-spread administration to our fallow crops, a no less general degeneration of this root has sprung up; an occurrence conclusive of this—that whether it be or be not in itself due to phosphatic manuring, at least it is certain that as special manures applied to this member of the plants of field cultivation, both bones and superphosphate of lime are alike signally destitute of either preventive or curative virtues to arrest the evil. Finally, as to the assumed discovery that a mere empirical admixture of several mineral salts is what will everywhere and in all soils and climates achieve a renovated leguminous luxuriance in our worn-out pastures, when duly examined, the experimental details exhibit nothing more than this—that belonging as the clovers do to Liebig's well-known classification of lime-plants, and amenable in a remarkable degree as they are to the influence of calcareous stimulant, the administration in three consecutive years of a mineral admixture of which lime in its most soluble of forms was a chief constituent, produced the natural and common-place consequence in a soil to which no calcareous dressing had been administered within the memory of man before, of exciting the relatively few clover plants existing in the ground at the time the trials were instituted, into vigorous growth and numerous multiplication.

THE SOIL AND THE SYSTEM.

A general review of the various rotations of crops adopted in England gives strong evidence that there is an intimate connection between the character and composition of the soil and the succession of crops which is most remunerative. Indeed the more fully this is investigated, the more definite is the evidence obtained. Our rich loams and clays, upon which beans and wheat are so successfully grown, are comparatively strong in those mineral ingredients which are required for these crops. When these two crops part company, it is the bean which is first compelled to yield to the inferior quality of the soil. And the reason is very clear; for the bean requires, for its economical growth, that the soil should contain more abundant supplies of alkaline matter and the phosphates than the wheat absolutely requires. When these bodies are present in only small proportions, we then find practical evidence that the land is not good enough for beans; still it may be sufficiently fertile for a wheat crop. By pursuing the same line of observation we have a ready explanation for the oft-observed fact, that peas can be successfully grown when the bean would be a certain failure, from the fact of mineral matter required for peas being less abundant in alkaline matter, and lime holding a more prominent position in its composition. In like manner we know that those poor sandy lands which cannot produce wheat profitably,

at the same time allow rye and oats to be economically grown. Here, again, the same key will unlock the hidden cause, by showing that both of these crops do not require rich mineral food to be present in equal abundance. The instances are numerous in which lands of this character, that only a few years ago could not produce any stronger corn than rye and oats, are now yielding wheat in consequence of their improved quality—a natural result of liberal farming and the use of good manure. Another familiar instance occurs to the mind in the selection of spring corn to follow the roots. If the land is not of good quality, we generally devote it for the oat crop, and certainly should not sow wheat. If the land is of rather superior character, and the condition favourable, then barley would probably be chosen; but if it is manifestly too good for barley, then the preference is given to wheat. Now the requirements of these crops, and the demand they make upon the soil, are just in the same proportion; the wheat asking the richest food, the oat the least valuable, whilst the barley takes an intermediate position.

It is in consequence of this influence exerted by the composition of the soil upon the crops which can be profitably grown, that we observe such well-established courses of cropping adopted in different districts. In

looking over the heavy-soil districts, we observe the following systems of cropping holding a prominent position :

<i>Kent.</i>	<i>Lincoln.</i>	<i>Bedford.</i>	<i>Surrey.</i>
Roots.	Fallow.	Fallow.	Fallow.
Wheat.	Wheat.	Oats.	Wheat.
Clover.	Clover.	Clover.	Clover.
Wheat.	Wheat.	Wheat.	Wheat.
Beans.	Coleseed.	Beans.	Beans or oats.
Wheat.	Oats.	Wheat.	
	Beans.		
	Wheat.		

These may be taken as fair specimens of the course of cropping which is successfully adopted when our heavy soils are of good quality. Some of these systems are more exhausting than others, and such are met either by the superior quality of the land, or by the more liberal use of manure. There is one striking feature observable throughout, viz., the frequent growth of wheat. In fact, the soils referred to may be considered some of the best wheat lands of England. The Kent rotation is materially assisted by the easy purchase of manure brought down in barges from London, and thus the land receives manure in the first and fifth year of the course. The nature of the land will not allow of dung being applied directly to the wheat, and hence it is found necessary to apply it at some other portion of the course. When used for the roots and beans, there is not that danger from over-growth.

The Lincoln course of cropping differs chiefly in the introduction of coleseed and oats in the fifth and sixth years, this being a desirable modification, and one that is convenient for the system of sheep farming there so well carried out. The Bedford rotation is rather singular, in consequence of the oats following the fallow; but it agrees with the course of cropping practised in Nottinghamshire, in consequence of the wheat being so liable to be laid when sown upon fallow ground, and particularly if the fallow has been manured.

In all the instances named, the wheat crop is placed after crops which are considered good in preparing the land for wheat. It either comes after fallow, clover, or

beans; and it may be as well just to notice what it is which renders this succession so desirable. When the land has been well fallowed, it becomes not only cleaned, but well charged with fertilizing matter, partly obtained from the air, and in part from its own hidden stores of fertility. The clover is especially valuable as a collector and preserver of that nitrogenized matter which experience shows to be so very valuable for the wheat crop. The bean is chiefly prized because, whilst it draws its necessary supplies of mineral nourishment from the land, it does not rob the soil of those materials which the wheat needs, but allows them to accumulate there ready for the succeeding crop. Thus, by each of these agencies we favour the capability of the land for the production of wheat, and so we see why these practices have been so successful.

In the cultivation of heavy soils, it unfortunately happens that a large proportion are not of such good quality as those to which we have been making reference. The poor and heavy clay soils of this country may be classed amongst the least remunerative land which is cultivated. Much of this description of land is found along the entire western side of England, from Durham in the north to Cornwall in the south. These soils are generally cropped either under a three years' course—fallow, wheat, oats—or else a six years' course—fallow, wheat, oats, fallow, wheat, clover. The more inferior qualities of land are seeded down after the second corn crop, for an indefinite period of time, and when broken up again are sown with oats. The length of time during which these soils remain in grass depends much upon local experience. Some become ready to produce corn much quicker than others, and will also be materially influenced by the quality of the herbage. For so long as this is remunerative it will generally be found advisable not to break up, because the labour and expenses are great in proportion to the crop obtained.

In this review of the systems of farming adopted upon heavy soils, we see how closely the experience of the practical man agrees with the testimony of science, and from this harmony we may hope in future years to see more gratifying results than the past has presented.

THE IMPLEMENTS OF AGRICULTURE IN AMERICA.

In all new settled countries the question of labour is one of the most important elements of consideration, and exercises a leading influence on its advance. Where labour is scarce, and mechanical appliances and implements for performing the work are few or unattainable, no progress, or only progress of the most slow kind, can be made. Even in this country, where labour is cheaper and more abundant than in America and our colonies, we yet find that enormous strides have been made in the employment of machinery for various purposes of cultivation and husbandry. The mechanical ingenuity, skill, and capital thus expended, no one will

deny, have been of vast benefit to the country, and that too without interfering with the employment or wages of the labourer.

But although there is, as we have often shown, a large and an increasing demand for our highly-finished tools, implements, engines, and machinery, in the colonies and foreign countries, yet in new settled districts something more simple, and less expensive, but equally efficient for the purpose, is often required. Some of the admirably-constructed carts, and ploughs, and machines, and mill-work, of British make, are, by the time they reach the far in-

terior, whether of the Cape colony or Australia, in cost much beyond the means of many a settler, who, moreover, when he gets them damaged or worn, may have at command neither the means nor knowledge to replace parts or put them together again. Hence it follows, that our American brethren, taking many an idea from us, often simplify it, by turning out some rough and ready, cheap, but strong contrivance, more adapted to the wants of the poorer settlers, or the farmers who cultivate rudely and readily on a large scale. An exemplification of these remarks was afforded in a paper recently read at the Society of Arts, by Dr. Eddy, giving an account of the American implements and economic contrivances which came under his notice in a tour in the United States. While by no means agreeing in all that was advanced by Dr. Eddy, there was much in his paper well deserving of notice, and of more extended circulation than the limited audience to which it was addressed. He justly observed, at the outset, that "the faculties of the Anglo-Saxon race have been developed in each hemisphere, just as the varying exigencies of their situation have called them forth. John Bull, having but a small estate for the maintenance of his numerous family, which is crowded in the ratio of 223 to the square mile, has applied all his powers to rendering this little property as productive as possible. Hence the great improvements in agriculture, in the rearing of stock, and increasing the productiveness of land, as well as a majority of the great inventions in the manufacture of raw materials are his. The Yankee, on the other hand, having a vast wilderness to subdue, to which his race even now bears a proportion of only eight to the square mile, has directed his energies to the means whereby man's feeble physical powers may be rendered equal to so great a task, and herein has shown an originality of conception, a fertility of invention, and a boldness of enterprise truly surprising."

There can be no doubt that most persons would be struck by the ingenuity of many of the American implements, their simplicity of construction, and cheapness, when compared with corresponding ones amongst ourselves, and the ready and effective ways for overcoming difficulties and aiming at results which we should only suppose attainable by more elaborate and costly methods. Dr. Eddy thinks that Englishmen, whether agriculturists, mechanics, or engineers, are not as familiar as they should be with the methods by which labour may be saved and is saved elsewhere; and this is a species of knowledge which either of these classes, or indeed any of us, may find very serviceable in case we transfer our industry from the crowded arena of England, where labourers are plentiful, and the division of labour is carried to its utmost extent, to the outlying and thinly-peopled parts of our vast empire, the circumstances and conditions of which closely resemble those of America; for it will be acknowledged that many of those happy contrivances and ways of meeting ordinary wants practised in America, though they may be but little suited to the highly artificial condition of England, would be likely

to be found very useful in the untamed wilds of our colonies.

And now let us glance at some few of the instances cited by Dr. Eddy. Firstly he mentions the backwoodsman's felling axe, which costs in America but a dollar, whilst "one certainly not better made, nor of better materials, would be charged here 9s." In reply to this, we can but state that our edge-tools are pretty well known, far and near, over the world; and, although the export trade returns are so mixed up that it is difficult to separate them, the shipments of hardwares and cutlery have gone on increasing year by year, and the United States, even with oppressive tariffs, takes £150,000 on the average annually. American edge-tools certainly have not competed very successfully with British in the markets of India and the East, the Cape and Australia. Nor does our experience accord with the statement put forth that an inferior and cheap kind of tool is made here for the market, in which the essential qualities are apt to be sacrificed. The British colonists and farmers are, in this respect, quite as shrewd as the Yankee, in ascertaining the value of a tool or an implement, and in finding out the difference between a good and a bad one. British manufacturers have established for themselves a reputation, and like to sustain the credit of their name and an extension of their business by the sale of a good article; and the law recently passed for the protection of trade marks will, we have no doubt, further assist them, and prevent infringement and fraud, which has been practised by the unprincipled here and elsewhere.

That the British plough-makers, of any repute, cannot compete in price with the American article, may be quite true; but the superior workmanship and durability of British ploughs will more than compensate for the difference in price. An instance was given by Mr. W. Hawes, one of the speakers at the meeting, who stated that a few years back Mr. Holmes (the American Consul at the Cape of Good Hope) introduced into that colony the American plough, at prices varying from 20s. to 30s. and 40s. each. For a time they had a great run, but within the last few years the English plough had been substituted. It was dearer, but stronger and more useful, and, he believed, was found to be more economical than the cheap, weak, imperfect American implement. That the American plough was got up very nicely indeed, for the price, he had no doubt; but he had been told by an experienced farmer that it was a great deal too weak for the work it professed to do, and was by no means an economical implement. At the present moment the principal British implement-makers have depôts or agencies in all the leading colonies, and are doing a thriving trade. And where cheap and rough ploughs, carts, &c., are required in the interior, whether in Upper India, the free states of Southern Africa, Queensland, or elsewhere, there are means of making them. Where the difficulty and cost of inland transport does not stand in the way, British-made machinery and implements will usually be adopted.

We have no fear of "English manufacturers being

beaten in the race by American ingenuity ;" nor do we see any imminent danger of being supplanted in our own colonies, as well as in other distant markets of the world, by our keen competitors. The Americans may find customers for some of their cheap inventions and implements in the near markets of the British American provinces, the West Indies, and Brazil : but even there our English makers are not far behind them in their sale ; and certainly in the former there has been a steady increase in our exports for some years past.

While differing on these points, we are ready to concede the merit of usefulness to many inventions and implements enumerated. The stump extractors would be invaluable in many parts of Australia and the West Indies. The stone-crushing machines would be found useful in our colonies for preparing material for the roads ; the simple kind of springs for vehicles on rough roads ; the grain scythe and cradle ; the " horse-power," as it is termed for brevity, by which animals are utilized, in a species of treadmill cart, connected by rotary motion by means of the axle of a driving-wheel, to such purposes as thrashing, grinding, winnowing, and such like ; the unloading fork, the shovel, the potato-digging plough, the elevator, and others which space would fail us even to enumerate.

There are many hints and notices in Dr. Eddy's paper well worthy the attention of colonists. Here is one on the snake or zig-zag fencing, worth adopting where wood is plentiful, as in New Zealand, Tasmania, and parts of Australia. " It is formed by laying slabs of split stuff, no matter how rough, one over another, with their ends overlapping, zig-zag fashion, till the requisite height is attained, and then driving posts in at each side where the ends overlap. It is as ugly as can be, and in the States the eye gets quite weary of its monotonous uniformity ; but the hard thrifty American farmer does not study the ornamental much. Not the least advantage that it possesses is that, whilst very strong against lateral pressure, it is easily pulled down in case of fire, or for removal of boundaries. Now, in Australia I have known many miles of expensive post and rail fencing burnt in a few hours, owing to the difficulty of pulling it down, and so arresting the fire. Cheaply as this fence is put up, so immense is the extent of it in the States that the total value of it has been computed to exceed that of all the houses and buildings there. It must be observed that there is difficulty in America in rearing live fences, owing to the severity of the cold in winter and the droughts of summer : the same difficulty is felt in our Australian colonies."

MEETING OF THE ROYAL DUBLIN SOCIETY.

This Great St. Leger of yearling bulls, which may be said to open the Shorthorn year, began on Tuesday, April 2, in the buildings of the Society adjoining the Museum. The show has been, year after year, a steady index of the advance of the Durhams in Ireland, and the number of bulls alone, since Dr. Collins, the present chairman, first entered the committee of agriculture in 1835, has increased from about 20 to 187. This Easter no less than 121 out of that number were entered in the yearling class, and we saw but very few stalls without their tenants. The contest derived great additional interest from the announcement that the judging was to be public, and that an extra fee of 5s. was to be charged up to four o'clock on Tuesday afternoon, in consequence. Breeders had grown weary of dawdling nearly a whole day in Dublin, eagerly feeding on such little scraps of intelligence, true or false, as might reach them, through " some little bird" from the show-yard, and argued that as Yorkshire, and other meetings in the North of England, have long since adopted the open principle, there was no " reason why" a Royal Society should not follow suit. The question had been very strongly agitated in the Royal Irish Society, but the council preferred waiting to see how it answered at Dublin before they came to any decision. The test was one hardly in point, as although the matter is easy enough to effect in an open-air ring, this was the first time, to our knowledge, that it was ever tried in a covered building. Thanks to the pouring day, which made a large reduction

in the number of visitors, the experiment was successful ; but it is quite evident that in future the main avenue must be left quite clear for the judges, &c., and the animals. As it was, the spectators were latterly allowed to come into the avenue ; and although the constables and other officials formed a *cordon* round the judges, and enabled them to do their work without let or hindrance, still there was often a great deal of inconvenient crowding among the animals on which they were not engaged, which ought not to be permitted. The committee had begun the day with the idea that they could " keep it dark," till all was over ; but when the spectators had been worked up to fever pitch, such secrecy was found impossible in practice. The judges especially felt it to be so, and very wisely allayed the popular excitement, by giving the lucky numbers, in their few disengaged moments, before the next class was brought out, to any friend who asked them. This is to be obviated for the future, and the public will not only be kept strictly to the galleries, but the Yorkshire plan will be carried out in its integrity, of handing different coloured rosettes indicating the respective prizes, H.C., or C., to the leaders of the animals, before they leave the avenue. All agreed that there had never been such a pleasant or such an exciting eight hours since the cattle show era began in Ireland, and by another year we expect to see the galleries crowded not only with young agriculturists who regard the spectacle as their best school of instruction, but by as much beauty and fash-

ion as crowded last year round the ring at Alnwick when Maid of Athelstane met Duchess 77th, and the hapless Queen of Athelstane was in her heyday.

As regards judges, the committee had experienced some difficulty. Mr. Stratton, who judged last year, was obliged to decline in consequence of a fall from his pony, and Mr. Unthank had so recently fractured a rib by making a false step on entering his cow-house, that he did not like to risk a voyage by sea. All the judges, except Mr. Doig, were thus placed *hors de combat*, but the vacancies were supplied by bringing Mr. Robert James Wiley from the sheep and pig section, and pressing Mr. Robert Holmes into the service at the eleventh hour. The breeders were pretty nearly all up to a half-past six o'clock breakfast, and a goodly number of them were present, when, at a quarter past seven, the judges commenced their inspection of the yearling bulls. With, however, the exception of Mr. Torr and Mr. Dodds, and two of the judges, we hardly met a single visitor from the other side of the Channel. Mr. Tallant and the Bushey Grove lot were nowhere to be seen; Mr. Eastwood's Rosette has exhausted her Irish honours; Col. Towneley did not show his hand; and if it had not been for Lady Pigot and Mr. Ambler (who was in the building on the second day), the great herds of England would have been almost unrepresented. Still her ladyship sent four, and Mr. Ambler six; and four first prizes and a gold medal were the joint results of their Saxon foray.

One of the galleries has this year been dedicated to the fowls, which kept up a very shrill and wearisome version of "Hail, smiling morn!" with cackling and gobbling accompaniments throughout the entire day; but the other, which is nearly above the stalls of the young bulls, was capitally adapted for anxious owners, as by looking over one side, among the Irish cloth and frieze stalls, they could watch the judges in their first "run through" the ranks, and command an avenue view from the other. The pristine array of young bulls was not very imposing; but when they had been sifted down to twenty-two, and re-formed in a long platoon, extending right down the avenue, the hidden strength of the class began to come out, and Ireland had no reason to be ashamed of her 61 hopes. Still we did not consider it to be a great year. Mr. Jonathan Richardson's *Lord Harris* and *Red Knight*, both by Prince of Warlaby, headed the rank; then came Mr. Barnes' *Friar Tuck*, a son of Dr. McHale and Ruby by Royal Buck. Two grandsons of Hopewell, to wit, *Ambrose* and *Bagatelle*, carried the fortunes of Mr. J. W. Naper; *Prince George*, by Prince, a son of Emperor (12835), was there to speak for Mr. G. Bomford and the pastures of Kells; *Prince Charlie*, by Bridegroom (15687), for Mr. C. Seaton, of Co. Tyrone; and *Lord of Athelstane*, to support the prestige of his sire, Lamp of Lothian, who was sold by Mr. Douglas to Mr. W. T. Crosbie, after winning this very prize four years ago. *Lucknow*, by Havelock, of Mr. Christy's breeding, was Col. Leslie's representative, along with *Victor Emanuel*, by Prince Duke 2nd. *Prince Roland* by Prince Arthur, and *Gamester* by Prince Talleyrand, both put

in their English claim for Branches Park and Halifax; while *Adam Bede* by Paul Potter (16688) stepped out boldly for Viscount Monck, and *Garibaldi* by a son of Emperor (12835) for Mr. W. S. Garnett, of Kells. Then there came *Young Mogul*, a grandson of Prince of Warlaby, from Mr. Patteson's, of Dundalk; *Knight of Straffan*, a grandson of The Monk, to do battle for Mr. N. Barton, of Straffan; and *Young Pam* and *Wood Ranger*, both by Lord Palmerston, to "keep up the ball" for Adare, Co. Limerick. Curraghmore had only one entry, but that one turned out to be rightly named *King of Hearts*, by Foundation (14565) from a Velvet Jacket dam. Next to him stood Sir Robert Paul's *Star of the East*, by Sunrise, with *Baronet*, by a son of Crystal Palace, the chosen one of Cabinteeley; and then *Welcome Guest*, by Volunteer (15476) from Mr. J. Doran's, of Castlebellingham, and *Master Jones*, by Lord Monk (14829), brought up the rear for Mr. F. Morice, of Springfield, Co. Clare.

Prince George and Prince Charlie soon had their chilling return orders, and then his herdsman "remote, unfriended, melancholy, slow," led off Adam Bede. Young Pam and Baronet became invisible in their turn, and so the drafting went on, till only thirteen remained. Another quarter of an hour, and Lord Harris and Ambrose had disappeared from the sides of their respective herd chums, Red Knight and Bagatelle; and these two, with King of Hearts, Friar Tuck, Victor Emmanuel, and, we think, Garibaldi, came right away at the judge's command, from the ruck, which now consisted of Gamester, Lord of Athelstane, Woodranger, and Master Jones. Garibaldi could not live the pace much longer; and it was evident that Bagatelle, with his nice Royal Butterfly head and colour, had no charms for the judges. It was a close race between the other four, first Red Knight for choice, and then Friar Tuck, while one of the judges seemed strongly disinclined to be shaken off Victor Emmanuel. Again and again the four walked up the avenue, the sturdy Red Knight exciting endless admiration by his close compact frame; but still his legs were not quite right, and his friends rather lost heart as they saw the judges point each other's attention especially to him on that point, and rather take exception to his tendency to be narrow behind. We also learnt afterwards that they were in some little doubt as to whether he would "strip" very well. Friar Tuck was very gay, but short of hair, and a little on leg, and "Gerty," kept his pupil's head up as proudly, as when he had Dr. McHale in hand last year. Perhaps he a little over-did it, as it brought out more prominently a slight thinness on the top of his chine. Victor Emmanuel was very little more than ten months, but still he was small for that age, and gave no promise of ever having quite size enough. His levelness and richness of coat were great points in him, but he had no breast worth speaking of. The staring colour of King of Hearts put him out of favour with the gallery; and besides that, he had hardly the style and quality of a first-class bull, although he was large, level, and true; in fact, it seemed to the majority to be a very desperate finish between Red Knight and Friar

Tuck, and so completely did the judges conceal their game, that a whisper (which almost rose into the dignity of a fact, and caused Messrs. Barnes and Richardson, who had retired for a chat in the back of the gallery, to receive the premature congratulations and consolations of their friends) went through the crowd, that the roan and red were in the first two places. However, it was not to be: the post was past, the judges made the pencil entries in their books of fate, and the great Easter secret was out at last, that King of Hearts had come up with a stealthy rush in the last few strides, and landed the old yellow-red Hubback colours first. Friar Tuck finished second, Victor Emmanuel third, Red Knight was highly commended as the reserve fourth, and Bagatelle, Lord of Athelstane, Garibaldi, Woodranger, Master Jones, and Gamespace were commended. People liked King of Hearts better as they examined him, and although perhaps he was not the choice of the house, all seemed to allow that the four best bulls had been most deftly sifted from the strange incongruous mass.

This exciting contest being over, the judges retired to breakfast, which they had richly earned by three hours' labour. Then the two-year-old bulls had to be gone through, and out of the twenty-five entries, Soubadar, the winner of the yearling class last year, and Little Wonder (both of them the property of the octogenarian, Mr. Coppinger), Lord Lurgan's Trumpeter, Mr. Barnes's Master Harbinger, Mr. G. Roe's Leviathan, Mr. F. Walsh's Count Cavour, and Mr. R. C. Lowndes's Gaylad were the only ones that passed muster. The two whites, Count Cavour and Trumpeter, were soon separated from their fellows, and it was soon patent to all that Soubadar was an easy winner, from the fact that the judges scarcely ever looked at him. They had quite enough on their hands, and were apparently in some difficulty as to the adjustment of the balance between Little Wonder and Master Harbinger, who although nearly six months younger, girthed only 1 inch less than Soubadar. He is a fine-fleshed son of Harbinger, and from Mr. Barnes's Blossom tribe, most beautiful in the head and level in the flank, but his shoulders were rather upright; while Little Wonder, although good throughout, had hardly such fine bull character. This latter point just turned the scale, although it was currently believed, for some time after, that Little Wonder had gained second place, and not the V. H. C. Leviathan looked as enormous as ever, though perhaps a little light in the flank for a bull of his size, and, like the Liverpool bull Gaylad, he won a commendation. Soubadar, who was the great beef centre of the show, has been well done to, and has gathered fashion since last year, instead of growing coarse, as many suspected he would. He has great liberty and elegance of outline, a fine coat, a twist and thighs not easily forgotten, and only a little inclined to be patchy on the top of his tail. The mean had been hit so cleverly between nice getting up and a working state that we trust that Mr. Coppinger will still further prove the excellence of his 200-guinea bargain by sending him over next July to throw down the Irish gauntlet in the aged-bull class at Leeds. He is by Prince of Warlabby (15107),

from a Baron Warlabby dam and a Hamlet grandam, and, as British Prince and Prince of Warlabby are both in Ireland, we may well look for some more Booth-blood triumphs.

Mr. Ambler's Great Eastern had a happy escape from him, as he was just twenty-seven days too old for this class, and carried off the three-year-old one with flying colours. Still the class was a very weak one, as out of the 27 entries only five were summoned to the avenue test. Of these Mr. J. W. Maxwell's Amphion was thick-fleshed, but common in his head and outline, and Lord Clyde walked a good deal better than he stood up. Mr. F. W. Low was also represented by a nameless Barley Sugar bull; Lord Talbot de Malahide's Mystery—a bull with longish hind-quarters and hocks well under him and not a very level top—was second, and Mr. Anderson's Lord Clyde, of Lord Dufferin's breeding exhausted the commendations. One of the judges thought so little of these four, that he proposed that no second prize should be given.

The dozen old bulls were of a very different stamp; and it was out of something more than respect for their age and the number of times some of them have stood on that floor of doom, that we saw them all ordered out. Mr. Ambler's Prince Talleyrand, that faithful henchman to Royal Butterfly for two English seasons, crossed the Channel on no bootless errand; and the head prize was his, almost from the first moment that the judges caught a glimpse of him. His back does not seem to droop so much as it did last year; but still he is not a very elegant bull when you stand behind him, and he had sadly lost his hair; a point in which Irish breeders seem to have a great pull over us, owing, we conclude, to climate causes. Mr. Jeffrey Barcroft's Sir Colin and Mr. Allan Pollok's Ambo had a hard struggle for the second honours; the former bore the hand better, but he had not the long, even, and short-legged frame of the son of old Monk, who took our fancy nearly as much as Soubadar: somehow or other the Sir Colin enthusiasm is dead. Although they were lost in the universal commendation of the class, it is fair to state that Mr. Allan Pollok's Pro Bono Publico, more commanding in size than in grandeur, Mr. Chute's bull, and Mr. A. Bole's Jacob were kept longer than the rest. Eight victors were brought out to contest the gold medal for the best of all the prize bulls in the yard, as well as the Irish Railway and Irish Farmers' Gazette cup; but all of them, from Prince Talleyrand down to the Kerries, two of which solemnly took their stand for the encounter, were very quickly cut down by Soubadar, who seems, with luck, to be on the high road to "skinning the lamb" in 1860-63.

Eighteen yearling heifers were selected out of twenty-five entries in a very rare class, but ten of them were shortly returned to the place from whence they came, and Mr. Ambler's Cactus by Prince Talleyrand, and Lady Pigot's Ladye Ælfrida by Prince Arthur, had to fight for the English interests, against the Marquis of Waterford's Princess Royal by Foundation, Mr. Allen Pollok's Golden Dream by Topham, Florentine and Veronica by Lamp of Lothian, Sir Robert Paul's Stay-

lace by Sunrise, and Captain Ball's Pride of Adare by Sol. Cactus had the beautiful crops of her sire in the very highest perfection, but her top was not very level, and she might have been better behind; and Golden Dream's legs were so wrong, that the judges, when they commended her, put on the Society's records, that, but for them she would have held a much higher place. Mr. W. T. Crosbie's two heifers, Florentine and Veronica, had, with Pride of Adare, nearly the whole of the last quarter of an hour's discussion to themselves. Veronica, who was a month younger, and considerably less than her herd companion, seemed the popular favourite, in spite of her twisted ankle and slight plainness behind; but at last she was beaten, and we think justly, by Florentine; and Pride of Adare, whose principal fault is that she has a slight tendency to be high behind, slipped in between them. The last time they met, Veronica beat Florentine. Lady Elfrida was highly commended, and Princess Royal was commended; so that, after all, the praise was more sparingly dealt out than we expected to have found it. Eight of the two-year-old heifers were then drawn for decision, and Lady Pigot's Victoria 35th was the first favourite. Nothing could be much better than she was, till you came to her head and neck, which were both decidedly stumpy, and blessed with very bad horns; and not all John Ward's artistic halter handling of her could communicate any lustre to that dull, half-weeping eye. In fact, on these points she so sadly lacked Shorthorn character that the judges seemed quite justified in not giving her more than third place. Their choice for first fell upon Captain Ball's Nightingale by Monk—no great handler, but a very neat heifer, much of the Towneley Fidelity stamp; and for second, upon Lord Waterford's Chaplet by Orator, which we had not expected to see quite so forward. The result was rather a surprise to the Captain, as he had fully expected to beat the Marquis with his *Recherché*, another daughter of Monk's, and reminding us much of what Woodrose once was—as he had done at Limerick County only the Thursday before. However, she could only win a high commendation, along with Sir Robert Paul's Sunrise; while Mr. Rowland's Campion's Ophelia by Lord Garlic, and Mr. A. Pollok's Picottee by Carlisle were commended; the latter was a plain robust-looking heifer, with gaudy legs, which she inherits from Royal Buck. She will only betwo years old on May 24th, and her calf has been born some weeks—"a great fact," which could not be put to the credit side of any other animal in the class. The result, as regarded Captain Ball's heifers, was a complete reversal of the Cork one, where *Recherché* was first, Chaplet third, and Nightingale fourth; although if Mr. Wiley had not then been outvoted by Messrs. Torr and Smith, she would have been higher up. She and *Recherché* have done good service to Captain Ball, as they formed two out of the three which won the 100-Guinea Royal Challenge Cup for him a second time at Cork; and later in the year defeated Golden Vein and Chaplet, which had been specially purchased by the Marquis of Waterford to save the challenge cup at Waterford from its now final resting-place on the Mondellihy sideboard.

Another pause for luncheon brought the second act of the drama to an end; and then Mr. Ambler's Woodrose was scarcely taken out of her stall to defeat Empress for the three-year-old heifer prize. The cows made quite a little sensation as the whole ten were brought out, John Ward in charge of his favourite Second Duchess of Gloster, and his son with Stanley Rose. Mr. Ambler's compact White Necklace by War Eagle, and the dam of two calves last year, looked not a little dangerous to Branches Park, when she was drawn up between them, and unconsciously shadowed forth her final destiny.

Mr. Christy's immense Queen of Beauty 2nd was kept to the last, when the other six had to retire; and although they had evidently no thought of her, it was some time before they could make up their mind among her three English rivals. Stanley Rose's attempts at walking were piteous, as her truck had got off the line near Holyhead, and she had gone nearly two miles "over the stones" to the quay. Still she left nothing but an *H C* to Necklace, and a *C* to Second Duchess of Gloster on this occasion, and made short work of the thick-fleshed but not very attractive Woodrose, when the winning cows and heifers in milk were out for the gold medal.

The fat cattle, which contained three gigantic specimens of seventeen-hand oxen, were good; but the rest of the Show, towards the Black Hole Corner, where Kerries, Alderneys, Devons, and a Hereford stood, was a strange medley mixture. No Ayrshires came, and only one West Highlander; and one of the two Scotch polled heifers got a man down, and knelt upon him, and savaged him so severely, that he was carried out apparently in an almost hopeless state by four policemen. Luckily it turned out that he was only "kilt" not killed. The pigs showed a steady progress, and were in nice breeding condition; and the sheep show was especially excellent, although Mr. Beale Browne's wonted array of Cotswolds were absent. Mr. Owen's Leicester, and Mr. C. W. Hamilton's Shropshire ram, would have most richly deserved their gold medals, even in the face of a still stronger competition. Their position in the show-yard, if it is a wet day, is an especially unfavourable one. On the first day it was with the greatest difficulty that they could be reached at all, owing to the slush; but the committee will carry a relief bill next year, if they can only get a coveted half-acre behind to enclose. Nothing can be more melancholy than the present arrangement, and the implement makers, as they sat on during Tuesday, for ten mortal hours, in the pour-down, waiting for the customers who never appeared, were subjects of the liveliest compassion, and more especially so, as they had done everything to deserve success.

The sale of bulls was exceedingly slow. Mr. Barnes got 110 gs. for Master Harbinger, from Mr. Jones, co. Waterford; Mr. Richardson 100 gs. for Red Knight, from Mr. Barton, co. Kildare; and Mr. Leslie the same for Victor Emmanuel, from Lord Talbot. The first-named breeder refused 120 gs. for Friar Tuck, as he preferred keeping him for Belfast, and perhaps Leeds. The general run of bull prices was from £20 to £70, but certainly not one-half of them were sold. About

£50 extra came into the Society's coffers on Tuesday, and £525 was the amount of the take for the first three days. At the general meeting of the Society the open judging was alluded to, as "having cut the ground completely from under the feet of disappointed exhibitors, by letting them see with their own eyes what pains was taken to arrive at a correct decision;" and any new building will be arranged specially with a view to it.

The Lord Lieutenant spoke with all his wonted elegance at the meeting on Wednesday evening. Last year the portly figure and colour of Dr. McHale suggested to him his Virgilian recollections of the snowy herds of Clitumnus; and this year, in expressing the hope that the Society might shortly have a spot of its own, apart from the Museum, he drew on Roman history for the story of how the sheep once strayed into the Forum. The following is a list of the awards:—

JUDGES.

Shorthorns: R. Wiley, R. Helme, and R. Doig.
Miscellaneous Breeds: D. Hastings, C. G. Grey, and Spencer Percival.

Fat Stock: W. Cotton, D. Kerr, and F. Wright.

Sheep: R. Wiley, J. M. Wilson, and S. Mowbray.

Swine: Major McClintock, Jonathan Bruce, and John Borthwick.

Horses: Hon. R. G. Talbot, J. L. Nolan, and — Darker.

NEAT CATTLE—BREEDING STOCK.

The "Irish Farmers' Gazette" Challenge Plate, value £155.—William Coppinger, Esq., of Barryscourt, Carrigtoohill, for his Shorthorn roan bull, "Soubadar."

The Irish Railway Challenge Cup, value £150.—William Coppinger, Esq.

SHORTHORNED BREED.

Best of all the Prize Bulls, the Gold Medal.—William Coppinger, Esq.

Shorthorned Bulls, calved in 1860.—The Ganly Challenge Cup, value £50.—The Marquis of Waterford, Curraghmore, Shorthorned yearling bull, "King of Hearts." Best bull, 5 sovs., and large Silver Medal, Marquis of Waterford; second best, 3 sovs., Thos. Barnes, Esq., Westland, Moynalty; third best, Honorary Certificate, Colonel Leslie, M.P., Glaslough. Highly commended.—Jonathan Richardson, Esq., Glenmore, Lisburn. Commended.—James L. W. Naper, Esq., Loughview, Oldcastle; W. T. Crosbie, Esq., Ardert Abbey, Tralee; John Keating, Esq., Cabra House, Moynalty; Captain Ball, Mondellihy House, Adare; and Henry Ambler, Esq., Watkinson Hall, Halifax.

Shorthorned Bulls, calved in 1859.—Best bull, 5 sovs., W. Coppinger, Esq., Barryscourt, Carrigtoohill; second best, 3 sovs., Thomas Barnes, Esq. Very highly commended.—W. Coppinger, Esq. Highly commended.—George Roe, Esq., Nutley, Donnybrook; and R. C. Lowndes, Esq., Vine House, Anfield, Liverpool.

Shorthorned Bulls, calved in 1858.—Best bull, 5 sovs., Henry Ambler, Esq.; second best, 3 sovs., Lord Talbot de Malahide, the Castle, Malahide. Highly commended.—James Anderson, Esq., Grace Dieu, Waterford.

Shorthorned Bulls, calved prior to 1858.—Best bull, 3 sovs., Henry Ambler, Esq.; second best, large silver medal, J. Barcroft, Esq., Kilbogget, Cabinteely. Highly commended.—Allan Pollok, Esq., Skahard, Creggs.

Shorthorned Heifers.—Best of all the prize breeding heifers, either having had a living calf, or producing a live calf within twelve months subsequent to the date of the show, the Gold Medal, Captain Ball, Mondellihy House, county Limerick.

Shorthorned Heifers, calved in 1860.—Best heifer, 5 sovs., W. J. Crosbie, Esq., Ardert Abbey, Tralee; second best, large silver medal, Captain Ball. Very highly commended.—W. T. Crosbie, Esq. Highly commended.—Emily Lady Pigott, Branches Park, Newmarket; and Allan Pollok, Esq., Skahard, Creggs. Commended.—Marquis of Waterford.

Shorthorned Heifers, calved in 1859.—Best heifer, in-calf, or producing a live calf within twelve months subsequent to the date of the show, 3 sovs., Captain Ball, Adare, county Limerick; second best, large silver medal, Marquis of Waterford. Very highly commended.—Emily Lady Pigot. Highly commended.—Sir Robert Paul, Ballyglass, Waterford; and Captain Ball, Adare. Commended.—R. Campion, Oldtown, Shanballymore; and Allan Pollok, Esq., Skahard, Creggs.

Shorthorned heifers, calved in 1858.—Best heifer, giving milk, or in-calf, 3 sovs., Henry Ambler, Esq.; second best, large silver medal, Augustus Warburton, Kill, Naas, county Kildare.

Shorthorned Cows.—Best of all the prize milch cows, the gold medal, Emily Lady Pigot.

Shorthorned Cows, of any age.—Best shorthorned cow, of any age, either having had a living calf within twelve months preceding the date of the show, or producing a live calf within six months subsequent to same, 5 sovs., Lady Pigot. Highly commended.—Henry Ambler, Esq. Commended.—Emily Lady Pigott; and John Christy, Esq., Fort Union, Adare.

HEREFORDS.

Hereford Cows of any age.—Best cow of any age, either having had a living calf within twelve months previous to the date of the show, or producing a live calf within six months subsequent to same. Large silver medal: J. O. G. Pollock, Mountainstown, Navan. Commended.—Allan Pollok, Lismaney, Ballinasloe.

DEVONS.

Devon Bulls, calved in 1860.—Best bull, large silver medal, Charles Poole, Wilford, Bray.

Devon Bulls, calved in 1858.—Best bull, large silver medal, the Earl of Charlemont, Marino, Fairview, Dublin. Commended.—George Roe, Esq., Nutley, Donnybrook.

Devon Heifers, calved in 1860.—Best heifer, calved in 1860, large silver medal, the Earl of Charlemont.

WEST HIGHLANDS.

West Highland Heifers, calved in 1860.—Best heifer, large silver medal, the Earl of Charlemont.

West Highland Heifers, calved in 1858.—Best heifer giving milk, or in-calf, large silver medal, the Earl of Charlemont. Commended.—Ralph S. Cusack, Esq., Bohomer, St. Douglough's.

West Highland Cows, of any age.—Best cow, of any age, either having had a living calf within twelve months preceding the date of the show, or producing a live calf within six months subsequent to same, silver medal, Allan Pollok, Esq.

SCOTCH POLLED.

Scotch Polled Heifers, calved in 1860.—Best heifer, large silver medal, William Owen, Esq., Blessington, County Wicklow.

Scotch Polled Heifers, calved in 1859.—Best heifer, producing a live calf within twelve months subsequent to the date of the show, large silver medal, A. Pollok, Esq.

Scotch Polled Heifers, calved in 1858.—Best heifer, giving milk, or in-calf, large silver medal, Lord Talbot de Malahide.

Scotch Polled Cows of any age.—Best cow, of any age, having had a living calf within twelve months preceding the date of the show, or producing a live calf within eight months subsequent to same, large silver medal, Allan Pollok. Commended.—Same.

ALDERNEYS.

Alderney Bulls, of any age.—Best bull, large silver medal, Phineas Riall, Esq., Old Connaught Bray. Commended.—E. Lawrenson, Esq., Sutton House, Baldoyle.

Alderney Heifers, calved in 1860.—Best heifers, large silver medal, Robert Collins, M.D., Ardsallagh, Navan.

Alderney Heifers, calved in 1859.—Best heifer, having had a living calf, or producing a live calf within eight months subsequent to the date of the show, Col. Kane, Bunbury, Moyle, Carlow.

Alderney Cows, of any age.—Best cow, of any age, having had a living calf within twelve months preceding the date of the show, or producing a live calf within eight months subsequent to same, large silver medal, George Dingwall, Esq., Verdon Hotel, Dublin. Commended.—Richard Warnaford Boyle, Esq.

KERRYS.

Kerry Bulls, of any age.—Best bull, large silver medal, William S. Garnett, Esq., Williamstown, Kells, county Meath, Highly commended.—Captain Bayley, Friarstown House, Taghlagh. Commended.—The Earl of Charlemont, and the Right Hon. Viscount Castlerosse, Kenmare House, Killarney.

Kerry Heifers, calved in 1860.—Best heifer, large silver medal, the Earl of Charlemont. Commended.—Richard Mahony, Esq., Dromore, Kenmare.

Kerry Heifers, calved in 1859.—Best heifer, having had a living calf within twelve months preceding the date of the show, or producing a live calf within eight months subsequent to same, large silver medal, Richard Mahony, Esq. Highly commended.—J. H. Ferguson, Esq., Stillorgan, county Dublin. Commended.—Ralph S. Cusack, Esq., Bohomer, St. Doulough's.

Kerry Heifers, calved in 1858.—Best heifer, giving milk, or in-calf, large silver medal, Ralph S. Cusack, Esq. Highly commended.—Thomas Butler, Esq., Priestown House, county Meath.

Kerry Cows, of any age.—Best cow, having had a living calf within twelve months preceding the date of the show, or producing a live calf within eight months subsequent to same, large silver medal, Ralph S. Cusack, Esq. Highly commended.—The Hon. R. G. Talbot, Ballinacra, Kingstown, Commended.—Richard Mahony, Esq.

Best of all the prize fat oxen, honorary certificate, won by Nathaniel Barton, Esq., Straffan.

Shorthorned Fat Oxen, calved in 1858.—Best fat ox, large silver medal, William S. Garnett, Esq., Williamstown, Kells, county Meath.

Shorthorned Fat Oxen, calved prior to 1858.—Best fat ox, large silver medal, Nathaniel Barton, Esq., Straffan. Highly commended.—same.

Hereford Fat Oxen, calved in 1858.—Best fat ox, calved in 1858, large silver medal, Allan Pollock, Esq.

Devon Fat Oxen, calved prior to 1858.—Earl of Shannon, Castlemartyr, Cork.

Fat Oxen, of any breed, calved in 1857 or 1858.—Best fat ox, large silver medal, Earl of Shannon. Commended.—William S. Garnett, Esq.

Pair of Plough Oxen, worked as Plough Bullocks.—For the best pair of fat oxen, of any breed, that have been fairly and *bona fide* worked as plough bullocks up to May, 1860, large silver medal, awarded to Nathaniel Barton, Esq.

Best of all the prize fat cows, honorary certificate, J. H. Jones, Esq., Mullinabrow, county Waterford.

SHORTHORNED.

Best fat cow, large silver medal, same winner. Second best, small silver medal, Lord Clarine, Elm Park, Clarine. Highly commended, Charles L. Ellison, Esq., Loughglyn, Frenchpark. Commended, James Reid, Esq., Summerville, Rathfarnham.

HEREFORDS.

Best fat cow, large silver medal, Richard W. Reynell, Esq., Killynon, Killucan. Second best, small silver medal, Allan Pollock, Lismany, Ballinasloe.

DEVONS.

Best fat cow, large silver medal, the Earl of Shannon. Second best, small silver medal, Edward Rotherham, Esq., Crossedrum, Oldcastle. Highly commended.—same.

WEST HIGHLAND.

Small silver medal, Allan Pollock, Esq., Lismany, Ballinasloe.

SCOTCH POLLED.

Best fat cow, large silver medal, Allan Pollock, Esq.

KERRYS.

Best fat cow, large silver medal, Charles L. Ellison, Esq., Loughglyn, Frenchpark. Second best, small silver medal, Wm. S. Garnett, Esq. Highly commended.—J. L. W. Napier, Esq., Lougherew, Oldcastle.

Best of all the prize fat heifers, honorary certificate, Earl Fitzwilliam, Coolattin Park.

Best shorthorned heifer, not exceeding four years of age, large silver medal, same winner. Second best, small silver, J. O. G. Pollock, Esq. Commended.—Lord Clarina, Elm Park, Clarina.

Best West Highland heifer, not exceeding four years of age, large silver medal, Allan Pollock, Esq.

Best Kerry fat heifer, of any age, large silver medal, J. O. G. Pollock, Esq., Mountainstown, Navan. Second best, small silver medal, same winner.

Best fat heifer, of any other breed, large silver medal, W. S. Garnett, Esq. Commended.—Hon. L. H. King Harman, Newcastle, Ballymahon.

SHEEP.

CAPTAIN BROUGHTON'S PRIZE.—A special prize of five sovereigns for the best pen of five fat cross-bred sheep, either ewes or wethers, yeaned in 1859, and bred from either Shropshire or Southdown sheep, James L. W. Napier, Esq., Lougherew, Old Castle. Best of all the prize long-woolled rams, the gold medal, William Owen, Esq., Blessinton. Best of all the prize short-woolled rams, the gold medal, Charles W. Hamilton, Esq., Hamwood, Dunboyne.

LEICESTERS.

Best one-shear ram, large silver medal, William Owen, Esq., Blessinton. Highly commended, George Thunder, Kingston Lodge, Navan. Commended, Colonel Leslie, M.P., Glasslough.

Best two-shear rams, or ram, of any other age, not exceeding four years, large silver medal, William Owen, Esq.

Best three hogget rams, never clipped, large silver medal, William Owen, Esq. Highly commended, George Thunder, Esq.

Best five ewes, with their lambs, yeaned in 1861, or in lamb, large silver medal, Augustus Warburton, Esq., Kill, Naas, county Kildare.

Best five ewe hoggets, never clipped, large silver medal, William Owen, Esq.

LONG-WOOLLED (not qualified to compete as Leicesters).

Best five ewe hoggets, never clipped, large silver medal, Francis Page, Esq., Eastgate, Lincoln.

SHROPSHIRE.

Best one-shear ram, Charles W. Hamilton, Esq., Hamwood, Dunboyne. Highly commended, Lieutenant-Colonel Tottenham, Woodstock, Newtownmountkenedy.

Best two-shear ram or ram of any other age, not exceeding four years, large silver medal, Charles W. Hamilton, Esq.

Best three hogget rams, never clipped, large silver medal, P. Broughton Esq., Cherry-mountain, Kells. Highly commended, Charles W. Hamilton, Esq.

Best five ewes, with their lambs yeaned in 1861, or in lamb, large silver medal, Charles H. Hamilton, Esq. Highly commended, same.

Best five ewe hoggets, never clipped, large silver medal, Charles W. Hamilton, Esq. Highly commended, same.

SHORT-WOOLLED (not qualified to compete as Shropshire or other Downs).

Best one-shear ram, large silver medal, Lord Clermont, Ravensdale Park, Flurrybridge.

Best two-shear ram, or ram of any other age, not exceeding four years, large silver medal, Lord Clermont.

Best five ewes with their lambs yeaned in 1861, or in lamb, large silver medal, James Wheeler Chapman, Esq., Moygaddy Farm, Maynooth.

Best pen of five long-woolled fat wethers, not exceeding two-shear, large silver medal, Samuel Garnett, Esq., Arch Hall, Navan. Commended, Francis Donagh, Esq., Newtown, Drogheda.

Best pen of five short-woolled fat wethers, not exceeding four years, large silver medal, P. Broughton, Esq., Cherry-mountain, Kells.

Best pen of five Cheviot fat wethers, large silver medal, Lord Clermont.

Best pen of five fat wethers, of any age or breed, not entered in the foregoing classes, large silver medal, P. Broughton, Esq. Commended, Samuel Garnett, Esq.

CAPTAIN BROUGHTON'S PRIZE.—A special prize of five sovereigns for the best pen of five fat cross-breed sheep, either ewes or wethers, yeaned in 1859, and bred from either Shropshire or Southdown sheep, James L. W. Napier, Esq., Lougherew, Oldcastle.

S W I N E.

Best of all the prize boars, coloured breed, the gold medal, Robert S. Backas, Esq., Butlerstown Castle, Waterford.
 Best of all the prize boars, white breed, the gold medal, Lord Lurgan, Brownlow House, Lurgan.

COLOURED BREEDS.

Best boar, six months, and not exceeding twelve months old, large silver medal, Robert S. Backas, Esq., Butlerstown Castle, Waterford; second best, small silver medal, William Joyce, Esq., Abbey Farm, Waterford; commended, Lord Clermont.

Best boar, exceeding 12, and not exceeding 24 months old, large silver medal, Lord Clermont.

Best boar, exceeding 24 months old, large silver medal, Joseph Radcliffe, Esq., L.L.D., Q.C., Cliff Lodge, Rathfarnham; second best, small silver medal, Marquis of Waterford.

Best breeding sow in pig, or having had a litter within six months, large silver medal, John Eustace, jun., Esq., Hampstead House, Glasnevin; second best, small silver medal, H. S. Murray, Esq., Sandycove.

Best three breeding pigs of the same litter, under 10 months old, large silver medal, William Joyce, Esq., Abbey Farm, Waterford; second best, small silver medal, Lord Clermont; commended, William Jameson, Esq., Montrose, Donnybrook.

Best litter of pigs, not exceeding five months old, accompanied by the sow, large silver medal, William Joyce, Esq.; second best, small silver medal, William Jameson, Esq.

WHITE BREEDS.

Best boar, six months, and not exceeding twelve months old, large silver medal, Lord Lurgan; second best, small silver medal, same.

Best boar, exceeding twelve, and not exceeding twenty-four months old, large silver medal, Lord Clermont; second best, small silver medal, Lord Lurgan.

Best boar, exceeding twenty-four months old, large silver medal, William Henderson, Esq., Elm Ville, Carlow; second best, small silver medal, Lord Clermont.

Best breeding sow, in pig, or having had a litter within six months, large silver medal, James L. W. Naper, Esq., Loughcrew, Oldcastle; second best, small silver medal, same; highly commended, Wm. Henderson, Elm Ville, Carlow.

Best three breeding pigs, of the same litter, under ten months old, large silver medal, Lord Lurgan; second best, small silver medal, James W. Chapman, Esq.; highly commended, James L. W. Naper, Esq.

Best litter of pigs, not exceeding five months old, accompanied by the sow, large silver medal, James Wheeler Chapman, Esq.

ROTTEN SHEEP.

The accounts we receive from different localities lamentably confirm the truth of the reported prevalence of rot in sheep, and that it prevails extensively in all districts subjected to (if I may not say cursed with) an inefficient drainage. The losses that flockmasters will sustain in this and the past year would have drained effectually these tracts of country thrice over. The accounts from Surrey are very distressing. Why Surrey? There are there so many downs and commons yet in a state of nature, and so wofully managed, that you can scarcely cross them in a tolerably dry season; much less then, in a wet one. Why is this? We know several of them, and they are not appropriated to military services either, which are in a continual sloppy, spongy state. Why, twenty-four hours' grazing on such pasturage is enough to rot the most healthy sheep; which facts upon facts can unmistakably prove: and if in Surrey, it is the same elsewhere. Depend upon it, wherever sheep are turned upon such pasturage as the above, the rot is inevitable.

It is attended with great danger to turn sheep to graze on well-managed and well-drained pastures after such a season as the last, and under the unfavourable prospects of the present year. The late rains have thoroughly saturated every land, and they are so continuous as never to give time even for partial drying. On this account, every danger is to be apprehended, and every known preventive must be sought for, to stem the dire irruption. It is in prevention mainly that safety can be attained. If once attacked, a cure is next to impossible; and the only right way then is to push them into condition as fast as possible, and send them to market to make what they best may. The fat ones will go to the butcher without loss, if timely seen; the store ones to a sorry finish generally.

What, then, are the best preventives? In the first place, continue to supply them on their pastures with roots—mangolds or turnips—as long as they will eat them. Give them also abundance of common salt—not rock salt; they cannot consume enough of that to be of any real benefit to them; rock salt may do very well in

addition, and some animals delight to lick it. Give them good rations of corn or cake; keep them exceedingly well, and be sure to get the pastures as dry as possible. Delay putting them upon the pastures as long as it appears to be prudent or reasonable. It increases the danger to put them upon short, wet herbage, or before the low and swampy parts of any pasture can have time to dry. Every weak animal should be dealt with otherwise than to be put upon these pastures. Keep them in a small bare paddock or yard, upon reserved roots or dry food. An attack of rot soon destroys them. The fattening sheep should be kept as highly as circumstances will allow. The sooner they are made fat the better. It is a well-ascertained fact, that for a few weeks after the disease takes place they will improve rapidly; but soon manifest declension shows itself. After this, it is to no purpose to continue grazing them; the only alternative is to sell them at once. As to the breeding and store stock, one can only lament the attack; nothing of any permanent value can be resorted to. They must take their chance. A few may recover, some may escape altogether. It may be observed, Why not sell them, as you do the fat ones? The fat ones go to the slaughter-house, the breeding and store stock to the grazier. Now, no one can honestly sell a diseased animal for a sound one for grazing purposes. The onus lies with the seller. If he sells them as unsound stock, all very well; but he gets precious little for them. It is a painful and destructive visitation, and the losses incurred often ruin the flockmaster. It behoves us, then, to do all we can to prevent its ravages; and this short notice is penned chiefly to draw attention to the subject, as many good men of business have often had their flock infected before they were aware of its proximity. "To be forewarned is to be forearmed." It is imperatively necessary, during the season, for all purchasers of sheep to require a warranty, just as they would for the soundness of a horse. The seller is liable for all damages incurred by selling unsound sheep, not only in the value of the animals sold, but the reasonable loss of profit by the purchaser. The proof lies with the purchaser.

THE MANURE OF THE FARM-YARD AND OF THE HOUSE-DRAIN.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

Of the importance of applying organic manures in the most economical form, no one need be informed; nor do any of my readers require any argument to convince them that the value of the farm-yard and other organic manures far exceeds that of all the artificial fertilizers hitherto so skilfully prepared for the farmer's aid.

The production of these manures, and their economical application in either their solid or liquid state, are still susceptible of general improvement. It is true that great advances have been making, for many years, in this important inquiry, but still there are several indications that there is more yet to be done in this way—not only in the use of solid organic manure, but also in its liquid or semi-fluid state. At this season of the year, we may usefully spend an hour in dwelling upon this important branch of the economy of the farm.

The most beneficial degree of moisture in which farm-yard dung may be applied, and the best use of its drainage-water, is hardly yet determined. To this practical question, Professor Tanner, in his prize-essay on the application of the manure of the farm, has addressed himself ("Jour. Roy. Ag. Soc.," vol. xxi. p. 347). As he observes, under certain circumstances, it does not appear advisable to carry out the box or pit system; and thus by the adoption of stalls, &c., we have the natural separation of the solid and liquid excrements to a great extent maintained. The former is generally removed to the manure-pit, whilst the latter runs away to the tank. The best mode of using this liquid manure is a disputed point; but various reasons induce me to think that we cannot do better than employ it in conjunction with the solid matter from which it had been separated. The solid manure, on being removed from the animal, soon undergoes a fermentation, that it may again assume a form adapted to the support of vegetable life. The value of the product depends on this process being duly regulated; and the presence of moisture is indispensable for preventing a too rapid or violent action. To this end, what liquid can be as beneficially applied as that which will restore those elements of fertility which have passed away from it into the urine, at the same time that it checks undue heating? By the aid of a pump and hose, the tank-water can be easily distributed over the fermenting manure, which should be moderately compressed, but not so tightly as to prevent the passage of the liquid through its mass. Many manure-pits are constructed so that they may drain into the tank. This is a good plan; for it enables the liquid to be freely used, without fear of adding too much to the heap. I am a decided advocate for the use of the liquid-manure with the dung of the farm, for I believe that, in their combined use, both act with increased advantage.

The adoption of this mode of using the liquid-

manure will, under a careful course of management, remove the necessity for further question as to the use of this fertilizer; but for those cases in which it is allowed to become intermixed with other water, or in which it is wished to apply it to the land in a separate condition, further comment is necessary. We have been gradually brought to the conclusion, adds Mr. Tanner, that although liquid-manure does possess valuable fertilizing powers, yet these generally exist in such a diffused state that the cost of application exceeds its value, and hence it is a very generally accepted rule that the distribution must be accomplished by its own power of gravitation, or under some cheap pressure.

The relative value of the liquid portion of the farm-yard manure made with sheep and by beasts does not, perhaps, under similar circumstances, materially differ. Some little time since, the urine of different domestic animals was examined, and the results obtained were as follows: 10,000 parts of each were found to contain of water and of solid matters—

	Water.	Solid Matter.
Of the sheep	9,600	400
„ horse	9,400	600
„ cow	9,300	700
„ pig	9,260	740

These are material questions to consider, when we are contemplating the use of sheep, as farm-yard manure-makers, instead of beasts. A very recent and important discussion of the Central Farmers' Club on that subject well deserves the attention of the practical farmer. The following brief summary of Mr. Gilson Martin, a Lincolnshire farmer, read by Mr. Ruston to the members, puts the case in a very useful form—

“The summary of my experience of the system is this: sheep in yards make more manure than beasts, with a less outlay of capital and with more profit. I scarcely ever got a profit, often a heavy loss, on the wintering of store beasts. I never had a loss on the wintering of sheep in yards. My impression is, that five sheep (six undoubtedly) make as much manure as one beast. I find sheep manure more quickly and more thoroughly rots, and becomes fit for the land. I have never tested their relative value side by side, but I have had no occasion to note any deficiency in the effects of sheep manure on any crop to which I have applied it. There is one other subject in connexion with the feeding of bullocks and sheep which is worthy our attention and our study. I refer to the quantity of food consumed by each animal respectively, and the quantity of flesh formed by the consumption of such food, or, rather, the increase of weight attained. Fattening oxen fed liberally upon good food—composed of a moderate proportion of corn or cake, some hay or straw-chaff, with roots—will

consume 12 to 13lbs. of the dry substance of such mixed food per week for every 100lbs. of live weight, and will give 1lb. increase for every 12 to 13lbs. dry substance so consumed. Sheep so fattening will consume about 15lbs. of the dry substance of such mixed food per 100lbs. live weight, and will increase 1lb. live weight for about 9lbs. of the dry substance of this food.

There is yet much to be learned in regard to the real value of liquid manure. It is a question too often undervalued by the very confused arguments by which its use is supported. Whilst, however, we are discussing the merits of liquid manure, the Flemish farmers are using it, as their forefathers have long done, carefully and systematically. But then we must not confound the rich liquid manure of Flanders with the merely discoloured waters of our homesteads. The "*engrais liquide*" of Belgium has thus been described by a recent explorer of the Flemish agriculture: "This term," observes Mr. R. S. Burn (*Quar. Journ. of Agriculture*, 1860, p. 105) does in Belgium, as is the case most generally with us, mean merely the liquid excretæ of the farm-yard cattle; it means this, but it means more; not only is this liquid excretion *saved*, but liquid manure is *made*, and that at considerable expense, and with the greatest care, by the Flemish farmer. The manufacture of manure, so to speak, is effected by him with the aid of human excretæ and rapecake. This saving and making of liquid manure demands an appliance, which forms an essential feature in every Flemish farm-yard, no matter how humble its pretensions, and limited the extent of land attached to it. The smallest cottage, with its tiny patch of ground, has its "liquid manure tank," the contents of which play an important part in reducing to fertility the wretchedly poor soil which the farmer has in so many parts of Flanders to cultivate.

This liquid manure is often so strong, that to avoid injuring the growing crops, it is applied to them in rainy weather, or after it is diluted with water. The most powerful of these liquid preparations, there called "*d'engrais flamand*," is used principally for flax, colza, hops, and tobacco; it is also used, but more sparingly, for the cereals. The quantity applied to the land per hectare is from 50 to 200 hectolitres.

"Those," continues Mr. Burn, "acquainted with the historical details of agriculture, are well aware of the important part the cultivation of green crops plays in Flemish farming; but it not so generally known that the success attained in this department, not only in raising good crops, but those in such quick succession, is mainly owing to the liberal supplies of manure, not given to the land merely before sowing, but to the plants at various stages of their growth. The whole gist, indeed, of Flemish farming is comprehended in their universally-current proverb, "No harvest without manure; no manure without cattle; no cattle without forage."

That given weights of certain organic matters are materially increased in value as manures by being fermented is certain, and that this enlarged value is still more important if the decomposing matters are mixed with a considerable por-

tion of water, has been long determined, not only by the almost universal practice of the Belgian farmers, but by the result of chemical investigations. To refer to one instance—we all know how important an ingredient in manures is ammonia. Sprengel, a celebrated chemist, analysed urine in three different states, in order that the effect of diluting it with water, previous to putrefaction, might be ascertained; he therefore examined the urine, first when fresh; secondly, after it had been putrified, unmixed with water; thirdly, after it had been putrified, after being mixed with its own bulk of water. The ammonia which he found in 100,000 parts of each was as follows;—

When fresh	205 parts.
After it had been putrefied by itself	487 "
After being putrefied, mixed with its own bulk of water	1622 "

The amount of ammonia in the urine, therefore, was doubled by putrefaction by itself; but increased nearly eight times when mixed with water. Such are some of the practical and deeply interesting facts, which should be carefully studied by the reader, who is contemplating the use of liquid manure. I have no doubt but that much more will yet be accomplished in this way than those farmers are apt to believe, who have not informed themselves carefully what liquid manure really is, regarding it, first, in the state when it is rich enough as that of Flanders, to pay for *carrying* on to the land; and, secondly, when it is so diluted as to be only available for grass lands, when flowing on to them, either by its own gravity, or by the aid of a very small artificial power, as at Edinburgh and other places. In these latter cases we have commonly a weak liquid manure, in which decomposition and the consequent increase of its ammonia has only recently commenced; still, under judicious management, there is much yet to be accomplished. The nearest spot to the metropolis where any considerable application of diluted liquid manure is taking place, is at Beddington, near Croydon, where the sewage of that town is constantly and successfully applied to a very valuable extent on grass land.

It was in consequence of the members of the Croydon Board of Health being desirous of comparing the sewage irrigation of other towns with that of Croydon, that Mr. Fenton, their engineer, made, during last March, a visit to the irrigated meads of Mansfield, Carlisle, and Edinburgh. The result of that visit will be found in the following interesting report, which he has just made to the Croydon Board:

"In reporting the information obtained, I should observe that in each of the three cases I saw the managers who had charge of the works, which they went over with me, explaining the system adopted, and giving the information contained in this report.

"At Edinburgh the land is situated on the south shore of the Frith of Forth, near Portobello. The part irrigated is $1\frac{1}{2}$ mile in length, and varying in depth from a quarter to half-a-mile; it is also divided along its whole length by the Portobello

road, and also by the North British Railway, and is about three miles distant from the city; a portion to the north of the railway slopes rapidly, but the other part has a slight fall only towards the sea, which washes the northern side.

"The sewer water is carried from the city for the most part in an open channel, which I was told became offensive in Summer, and when within a mile from the farm there are deposit-beds, which are emptied occasionally, these are not, however, under the control of the farmer who hires the land.

"The system of irrigation is very simple. A main water-course is led along the highest part of the ground, from which irrigating channels proceed, at distances of about 150 feet, and these are deep enough to drain the fields when the water is not on; it is not levelled, but very uneven, but as the water is on only for a day, the farmer states that this is of no consequence.

"The whole of the Craigintinny Farm, consisting of more than 600 acres of land, is hired by the present tenant, and that part irrigated next the road is let by him every year by public roup or auction, in lots of under one acre each, to the cow-keepers for the season; the lowest price £15 per acre, the highest for any part £40 per acre, but this last price was given under peculiar circumstances, and only applied to one lot. The land was waste land before the water was applied, and worth only about 2s. per acre.

"None of the grass on the land thus let is made into hay, but is cut green, and carried to the places where the cows are kept, in different parts of the city. The number of times that the mowing takes place varies with the season, and the ideas of the parties hiring, but it has been by some cut eight times in one season. The grass is now about four inches high, not much better in appearance than on the pasture fields at Beddington. The quantity of sewer water flowing does not exceed the quantity now passing from the Croydon sewers, but I think that it is not quite so diluted.

"I should also state that they have an engine and pumps to raise the water to those parts of the farm above the level of the sewer water course, but this is not often used, as, although the farmer states that it answered his purpose to pump it, it pays him, of course, better to let it run by gravitation on to the fields.

"At Mansfield the system is very different, and much more complicated, engineering works of a very expensive kind having been erected by the late Duke of Portland, to divert the water from a small river which passed along the bottom of the valley below Mansfield, to the crest of a hill, in many places 80 to 100 feet higher than its original course, the land between the new channel and the old water course being subjected to the irrigation process.

"The new channel or water course receives the sewage from Sutton, Mansfield, and several villages and factories above, for some miles, and also the rain-fall and springs for several miles of district. For a distance of three miles it is not used on the land; at the point where the irrigation commences it is 18 feet wide, and on Saturday was two feet deep, running at the rate of about one

mile per hour. After the commencement of the irrigated fields, the main channel passes for five miles in a very tortuous course, following the variation in the level of the high ground, with a road to the farm intervening between the water course and the fields for about half its length.

"From this description it will be seen that the irrigated land is very steep, having so much fall that in order to retain and separate the manure from the water, and to prevent its passing away too quickly, four longitudinal channels have been made along the side of the hill or slope: feeders to supply them lead under the road, at the distance apart of about 200 yards, to supply the top irrigating channels, from which the water passes over the grass to the next channel, and so on in succession until it reaches the old river bed, where it forms a sparkling stream, but from its rapid passage over the land it has not lost all its virtue, but is again passed over the meadows of Cliptone Park, a distance of seven miles from the beginning of the works before described. Its beneficial effects, however, are not so perceptible here as on the land where it is first used. The whole farm is more than 900 acres; the land irrigated 400 acres; and the late Duke did not allow any artificial manure to be used, but in the spring and autumn had the grass cut green, and carried to the farm-yard, where it was consumed, partly by cattle, and partly used for litter, all the grass being once mowed for hay in the season.

"The system now pursued is different. All the land is now once mowed for hay, but in the spring and autumn a large number of beasts and sheep are kept, so that it is not dependent solely on the irrigation for manure, and could not be quoted as a perfect specimen of the effect of sewage water. A great portion of the land now irrigated was not worth 2s. 6d. per acre, but it could now be let (although at a distance from any large town) at £4 10s. per acre, which the bailiff told me had been offered for it.

"At Carlisle the quantity of land irrigated is 80 acres; it is a very flat piece of meadow, with the river on two sides; there is no means of exit for the clarified water, but through the soil, which is very porous. The irrigating channels pass all round, and intersect the land, which the water is allowed to cover in sections during the day; and although it covers the allotted sections during the day, it soaks into the soil during the night so as to be imperceptible in the morning. I cannot give the result of the process here as respects rent or profit, as Mr. McDougall, having only commenced in the spring of last year, is not prepared to give the particulars.

"The sewer water from Carlisle is not pumped on to the land continuously, as the discharge pipe is only ten inches in diameter. During and after rain a portion is allowed to run into the river, and all the water passing from the sewers between six in the evening and six in the morning, flows into the river direct, without going over the meadow. The irrigating channels are very well made, and the slope nicely turfed; but—although the population of Carlisle is 30,000—the run of water is not one-fourth of that passing from the Croydon sewers, so

that no comparison can be made from the extent of population as to the quantity flowing. The effect of the use of the deodorising fluid is very perceptible, as there is no smell, whereas the sewage scent was clearly discernible both at Edinburgh and Mansfield, in the main channels, before it had passed on to the land. I could distinctly perceive it, although the hills around Edinburgh were covered with snow, and the thermometer stood at 40 deg., and the report of several persons residing near the sewer water course was very unfavourable as to its state during the summer months."

I have much pleasure in being able to add, that the 292 acres of land at Beddington, in Surrey, which is held by the Croydon Board of Health, and to which the sewage of Croydon has only very recently been partially applied, has just been subleased by the Board to a responsible farmer and cow-keeper, at an advanced rent of two hundred and forty-eight pounds, viz., for what the Board pay £1,252 per annum, they will receive £1,500. The 292 acres are composed of 251

acres of arable, and 41 acres of grass, and it is to the grass land only that the sewage has hitherto been applied; but the effect is so decidedly excellent, that the incoming tenant intends to immediately lay down and apply the sewage to all that portion of the land which is now arable that can be irrigated, and this will include nearly the whole of the 251 acres.

We may, even from these rapid practical notices, derive very useful information. That the manure of our domestic animals has long been made in enlarging amounts, and of a more enriching quality, is certain. That this onward progress is still making, there is as little doubt; sewage irrigation, too, is extending. We need not, indeed, fear that anything like perfection will ever be attained in this or any other branch of the agriculturist's manifold cares. The skill of our great cultivators has always hitherto been nearly equal to the demands made upon them, and there are no symptoms of either their science or their zeal being exhausted.

THE FARMER AND THE FRANCHISE.

That the tenant-farmers have in reality no representatives in Parliament is a very old story. "The Agricultural Interest," as so called, or "The Country Party," as otherwise identified, will, as a rule, be spoken to as the country gentlemen, who simply represent themselves. When a farmer's own question comes on, the Squirearchy carefully keep away, or sit in sulky silence, asking themselves what business Mr. Caird has to interfere in such matters? Nay, in a very recent instance, the county members actually opposed their constituents, and voted almost to a man that the occupier should have no voice in the heavy expenditure of his own district. Well then may the Reverend Lord Sidney Godolphin Osborne, when considering the case of the tenant, refer to the exercise of the franchise as "rather a delicate point." His lordship certainly treats it of delicately enough; and this passage is perhaps the only piece of specious oratory in his generally able address. Still Lord Sidney professes to speak out even here; and indeed the subject has been as it were forced upon him, "from the conviction that the truth is rarely spoken about it." In the first place, this is what is too commonly received as the fact: "There are a certain class of writers and speakers who assert that a tenant farmer loses as such his political independence, that his position as a county voter is nullified by his becoming a renting tenant on any large estate." But his Lordship proceeds at once to deny this:—"I do not credit all the stories I hear of landlords compelling their tenantry to vote against their consciences. It may be very true that in the great majority of cases tenants do support those with their votes for whom they know their landlords are interested, just as in many other matters carried by election, men vote not directly as they regard the merit of the candidate, but to oblige their friends. It is true that most landlords would with regret see it otherwise. But where any question arises affecting the interest of the tenantry as a class, or affecting the deep-seated political or religious feelings of individuals, I believe and I hope there are few, if any, landlords who would try to restrain the freest exercise of the franchise." This is very carefully put, but there may be more in it than was perhaps in-

tended. However, at best or worst, the tenant in a general way is advised to make the landlord's interest or views his own. The point—one by the way Lord Sidney does not press—is whether, as times go, the farmer can continue, as a duty to himself, to act in this convenient and indifferent manner? Should they not, as a class, make it more their business to know something of those gentlemen "in whom their landlords are interested." As *Tony* answers to his mamma, in Goldsmith's comedy, "I don't care so much about disappointing my friends, but I can't bear to disappoint myself." So the farmer will have to consider whether he should not oblige himself instead of obliging his friends. Lord Sidney believes "one of the great binding supports of our Constitution to be, that landed property should have great political weight, and that it is most important to the permanent interest of the renting occupiers that it should do so." Taking our opinion from the experience of the past, it is hard to find the force of this. What of late years has the great political weight of landed property done for the permanent interest of the renting occupier? Is there a single act, intent, or even speech, in the history of many sessions, where landed property has done, or attempted to do anything for the renting occupiers, or to rank them of a class in the state? Have they not rather been taken as part and parcel of landed property, without any individual status of their own? Lord Sidney says, "Where one man ever gives a vote from party feeling alone, how many thousands, feeling no real party interest, vote to oblige those whose goodwill they desire to preserve! So far from thinking a tenant who has no pressing conscientious feeling in the matter wrong for voting, as the rule, with his brother-tenants, in support of the landlord's wishes, I think him not only prudent, but in every way justified." This is the very rock the tenant-farmer has split on. He has so far allowed himself to have no "real interest," but has voted to oblige those whose goodwill he would have. He has admitted of no conscientious feelings, but voted, as a rule, as others voted. And what has been the inevitable consequence of such a course of self-negation? Why, that he has no voice whatever

of his own in the state—that when a question of vital importance to him comes on, there is no one to press it; while, as likely as not, he will be opposed by those very men he has sent up “to oblige his friends,” and in whom “his landlord is interested.” Lord Sidney Godolphin Osborne is talking here on the duty of the tenant, and we say that the tenant's own duty to himself should teach him to take a real interest in an election, to assert his own conscientious feelings, and to know something of the intentions of those he has “the privilege” to select as his *representatives*. We do not counsel the farmer to fly wilfully in the face of his landlord; but we are living out of an age when men are to be driven up to vote “as the rule with the other tenants.” As Lord Sidney himself says further on, “the duty of the tenant is to respect the head of the estate under whom he occupies. It is not his duty to sell this respect for the poor offering of a designing civility. He must be *free and independent* to offer what he feels for one, really induced to feel and act kindly towards himself.” Precisely so! But this advice, as to being free and independent, scarcely agrees with the tolerably broad hints that the man should have no political opinions of his own; but that as a matter of *prudence* it is his duty to go with the drove, and vote as his landlord wishes.

It will be seen that thus far we do not concur so heartily with the reverend and noble lecturer, in his interpretation of a tenant's duties as we did in his exposition of the landlord's case. In a word, the occupier is treated of in a far milder tone, and more in the language of the pulpit than that of the lecture-room of business-men. Everything is made to depend upon the cultivation of mutual good feeling, while there is an evident care shown not to go too far beyond this phase of the question. The force of the farmer's example to others, and the worth of his moral character, are thus amongst the other prominent features of the sketch—dashed off as they are with more freedom than when shadowing in the nice touches of political conscience. Here is an every-day question, with a straightforward answer to it:—“Is a landlord justified in getting rid of a tenant on grounds which only affect that tenant's moral character? I hold it as a rule that it would be as impertinent in a landlord to take notice of the domestic life of a tenant as it would be in the tenant to do so in regard to his landlord. But there may, and will unhappily sometimes be exceptional cases, in which interference on the landlord's part may not only be proper, but in my opinion imperatively demanded. Where a tenant has, by open notorious dishonesty, or continued open profligacy in his daily life, become so far a disgrace to the estate that he exists on, openly defying the laws of common decency and morality, an example of evil, a disgrace to his own class, I do think it is the duty of the landlord to remove him.”

Perhaps, either from having been so much discussed of late, or from having himself spoken so often of the labourer's condition, the third division of the subject does not strike one so strongly in Lord Sidney's lecture. The best “bit” is introduced incidentally when still considering the tenant's position, and his relative duties to those below as well as above him. Indeed, as put, it comes fairly enough under the second head, in demonstrating the conduct of the employer to those about him: “I am well aware that farmers are exposed to a great deal of petty depredation. I say it is your duty to at once in every instance check this by all the means in your power, even with the utmost severity, if necessary; at the same time you are bound not wantonly to expose your labourers to temptation.

Bear in mind that the ‘winking’ at trifling crimes is, in reality, sowing the seeds of great crimes. Many a man whose stealing handfuls of corn daily was connived at, has ended by stealing sheep or fowls. Let it be understood upon your farms that it is with you a principle of duty never to connive at anything wrong, and you will thus soon raise and keep up an honest tone amongst your men. I can quite enter into your difficulties in the matter. Custom has, alas! almost sanctioned certain kinds of petty dishonesty; and there are those who now fear to check it. It may require some little moral courage; but that man is not fit to hold up his head as honest in open market, who from fear or favour willingly connives at dishonesty on his farm. In whatever way you hire labourers, ever make the terms of the agreement as clear as possible to them, and then justly abide by them. The highest character I ever heard given of an employer is that ‘He is a just man, but kind; will have what is right, but gives it himself.’”

This is the second paper we have now devoted to the Blandford Lecture; and we have done so alike from the source it emanates as the matter it contains. As we have said, the strength of the address lies in the definition of the landlord's duties. There is a boldness in dealing with the owner's rights and wrongs that is not so observable when we come to the occupier. In fact, it is not so easy to reconcile the two, without we take one as entirely dependent upon the other. Then, if everything is to flow from the landlord, of course much should be given where so much is expected. But this is a reading which will be scarcely acceptable in the present day, and we should prefer, as we have placed them, that either portrait should stand upon its own merits. They are not, we repeat, of equal excellence, but our columns would hardly have been complete without the pair, and we have thus again given his Lordship the preference over the many able lecturers abroad. Amongst others, Mr. Bond, the Secretary of the Suffolk Agricultural Society, and well known by his previous successes in this way, has been addressing the Framingham Farmers' Club on “The Future of Agriculture as deduced from the Past.” Mr. Hannam, the Secretary of the Yorkshire Society, has been talking to the Wakefield Club on a kindred topic, “Agriculture, its Progress and Prospects”; and Mr. Ruston, of Chatteris, has been reading a most practical paper on an essentially practical subject at the Central Club. The last-named of these is, as usual, given in full, so that our readers may themselves judge of its worth.

DEATH OF LORD BERWICK.—On Friday, April 12, after long and severe suffering from an internal tumour, died the Right Hon. Richard Noel Noel-Hill, fifth Baron Berwick, at his seat Cronhill, near Shrewsbury. The deceased was son of the fourth Baron, the Hon. and Rev. Richard Noel-Hill, Rector of Berrington, Salop, by the second daughter of the late Mr. Mostyn Owen, of Woodhouse, Salop. He was born at Betton, Salop, in 1800, was educated at Rugby, and succeeded his father in 1848. He is succeeded in his title and estates by his next brother, Colonel the Hon. William Noel-Hill (now Baron Berwick), who entered the army in 1817; served in the Burmese war in 1825-6, and was present at the battles of Promé and Tandwayn. In 1854 he attained his Colonelcy, and retired in 1855. The deceased nobleman devoted himself almost entirely to agricultural and mechanical pursuits. He was one of the most successful breeders in England of Hereford cattle, and his farm-buildings are models of order and neatness. He has obtained numerous prizes at the shows of the Royal Agricultural Society, at Birmingham, at the Smithfield shows, and several places in the provinces. His genius as a mechanic was extraordinary, and he was a first-rate rifle shot. He took no part in politics, but the family are Conservative.

REVIEWS. RICHARDSON'S RURAL HANDBOOKS.

ILLUSTRATED, ONE SHILLING EACH.

RURAL ARCHITECTURE ;

A SERIES OF DESIGNS FOR RURAL AND OTHER DWELLINGS, &c., &c.

London : Rogerson & Co., Strand.

This work has already, in a former edition, received the approbation of the public, evinced by its rapid sale ; and it is now re-issued at an appropriate period, when the domestic condition of the rural peasantry, and of the operative classes generally, is under serious consideration, with a view to their moral and physical improvement.

In many parts of the country the dwellings of the agricultural labourers are a disgrace to our boasted civilization ; and it would appear, from them, as if some of our landed proprietors, while they expend thousands in ministering to the comfort of their dogs, horses, &c., look upon the farm labourer as below them in consideration, and suffer them to reside in hovels to which they would not consign a bullock, or even a pig, and which are a blot upon their estates.

On the other hand, the subject has been taken up by some of our leading nobility and gentry, who with a liberality and promptness worthy of imitation, have expended large sums in the erection of cottages for the labourers on their estates, which, while they form highly picturesque embellishments of the property, tend to raise the moral character and feeling of the class for whose welfare they were designed ; and at the same time they contribute to their physical comfort and sanitary welfare.

The work before us affords ample information with respect to the best mode of building rural cottages, as well as farm-houses and outbuildings, &c. It contains thirty-one plates of plans and elevations of different kinds of structures, drawn with a reference to "fitness or utility, expression of purpose, and uniformity of design." The heading of the second chapter gives a sufficient idea of the scope of the work, embracing "the general principles of constructing houses, site for a country residence, and the importance of employing an architect in all building undertakings." The rest of the body of the work treats of the rules for arranging the different parts of a building, &c., and on the various materials to be employed. The appendix is appropriated to the subject of labourers' cottages, with an express reference to sanitary considerations, illustrated in the report on cases of fever at Great Horwood, Bucks, in 1858, by Dr. Acland.

The first editions of this work sold immensely, and we venture to say that the present one will not remain long on hand. It ought to be in the hands of every landowner and farmer in the kingdom, and would be of no little use to the labourer. In our opinion the question of the moral and material welfare of the peasantry is involved in the subject of it, and these are connected with the prosperity of the landed interest to a far greater extent than many of our gentry are aware of. The Legislature has removed one of the greatest obstacles to this species of improvement of entailed estates, by enabling the possessors to borrow and expend money (under the provisions of the Drainage and Improvement Act) in the erection of labourers' cottages, the repayment of which is charged upon the inheritance. There is, therefore, no excuse now for a landowner letting his poor dependants live in hovels he would not think good enough for his greyhounds, or even his swine.

Fortunately this subject has been so well ventilated of late years that it can no longer be ignored or laid aside. Fresh evidence of its importance is daily being elicited ; and, it is gratifying to add, fresh advocates of weight and influence are as daily coming forward to promote the object. The Duke of Bedford has set a noble example, and his success has stimulated others to adopt his plan. We hope that before long the estates that remain *in statu quo* will form the exception, and not the rule ; and that the condition of the rural peasantry will soon be viewed as one of the most important considerations in the management of a landed property.

DAIRY STOCK : ITS SELECTION, DISEASES, AND PRODUCE : With a Description of the Brittany Breed.

BY JOHN GAMGEE.

Edinburgh : Thomas C. Jack, 92, Princes-street. London : Hamilton, Adams, and Co. 1861.

This is a useful publication, which enters into the subject of the choice of cattle for forming a dairy, pointing out the peculiarities of the prevailing breeds in regard to their milking properties, aptitude to fatten, and constitutional endurance. It also treats of the diseases to which they are subject, the symptoms and cure, with a scientific dissertation on the qualities and composition of milk, the diseases of cows which affect their milk, &c., &c. The system of Guenou, of judging of the milking quality of a cow by the *scutcheons*, or that remarkable appearance on the hinder part of the cow above the udder, on which the hair is turned the wrong way or upwards, and which is common to all the bovine races, is fully explained, and wood-cuts of the ten different forms it assumes are also inserted in the work. The description and qualities of the recently introduced Bretonne cow are also given, as well as of the character of the people of Brittany, and of the country itself, forming a short but entertaining conclusion to the little volume.

BATH AND WEST OF ENGLAND SOCIETY.—

The usual monthly meeting of the Council of the Bath and West of England Society was held at Waghorn's Railway Hotel, J. W. Buller, Esq., M.P., president of the Society, in the chair. The following members of the Council were also present : Messrs. E. S. Drewe, H. G. Moysey, J. Belfield, J. Widdicombe, J. Gould, R. May, G. Langdon, W. Thompson, J. S. Poole, R. Bremridge, J. Bailward, J. Lush, R. K. M. King, C. Bush, H. A. F. Luttrell, D. Adair, and John Gray. The Mayor of Wells attended as a deputation from that city, and stated the arrangements that had been made, and also the guarantee fund for expenses. A deputation was appointed to meet at Wells on the 3rd May to inspect the lands proposed to be used for the show-yard and for the trial of implements. The mess committee reported that satisfactory arrangements had been made with the proprietor of the Red Lion Hotel, Truro, for the accommodation of the members of the Council, and that reasonable prices would be charged. A set of the Journals of the Society was ordered to be presented to the Taunton and Somerset Institution. The following new members were elected : Messrs. C. F. Perkins, The Grange, Kingston ; P. Palmer, St. Erny, Landrake, Cornwall ; E. Marshall, Plymouth ; W. H. Harford, Wington ; W. Watts, Newton St. Loe, Bath ; W. James, Newlyn East, Cornwall ; G. and H. Stephenson, Plymouth ; T. Pearse, Ivy Bridge ; and T. Webber, Kingsbrompton.

THE NORTHAMPTON HORSE SHOW.—As previously stated, the prize for the best stallion for agricultural purposes was not awarded, in consequence of the animals shown either being unsound or not of sufficient merit. The judges, however, made their award in favour of a Suffolk horse, which Mr. Owen Wallis has recently bought of Mr. T. Crisp, of Butley Abbey. This stallion was warranted sound when sold, Mr. Wallis' own veterinary surgeon also passed him, and the judges of the show considered him sound ; but Mr. Stanley, of Leamington, who was the appointed veterinary inspector, rejected him as having thorough-pins, his hocks being a little enlarged and full from being capped, and rather sprained by his covering at two and three years old. His owner and many others still deny that the horse is unsound. Other professional opinions are to be taken about him ; while it is proposed for another year that the veterinary inspector shall simply report to the judges, who shall then use their own discretion as to rejection or not. Mr. Stanley condemned four, out of the five exhibited, as unsound ; and the other had no merit. The judges were Mr. C. Fleisher, of Cold Ashby, Northamptonshire, Mr. W. Gulliver, of Swalecliffe, Banbury, and Mr. W. Tindall, of Wheatley, Doncaster. The same kind of thing occurred at Waterford two or three years since, when the horses selected for the premiums were rejected by the inspector, although one of them at least was generally pronounced eligible.

CALENDAR OF AGRICULTURE.

The planting of beetroot and potatoes must now be quickly finished, if any remains undone from last month. Horse and hand hoe all drilled crops; allow not a single weed to be seen.

Turn over the heaps of winter-prepared farm-yard dung, and the fermentation will readily commence; during its progress, place the dung in drills, reverse the ridglets, and sow the seeds of Swedish turnips without delay on the fresh tilth of soil. Much benefit is derived by bringing the seeds into a near and immediate contact with the fermenting dung. In the first place, sow swedes green and yellow, then Laing's and Matson's hybrids, and follow with Aberdeen yellows. In dry weather, roll the drills immediately; in moist and showery weather it may not be required.

Plant cabbages, kohl rabi, savoys, and winter brocolis from the seedbeds, on drills three feet apart, and the plants two feet asunder along the drills. Apply half-rotted farm-yard dung in a very moist condition, and in a large quantity, on stiff loams that are too clayey for turnips; and dibble the plants into the ground during wet weather, as the vegetables require much moisture. Fill up the blanks with fresh plants, in order to procure an even crop. Sow early turnips for an early crop, as tankards and whites; and sow rape to be consumed on the ground, as preparatory for wheat.

Pare and burn rough lands, and spread the ashes in order to be cooled. Prepare the fallows for green crops, and also clay lands for wheat.

Stall-fed cattle will now be disposed of; the fat ones for the butcher, and the leaner will go to the pasture fields to be fattened on grass. Put the milch cows to grass in a home field of permanent pastures adjacent and convenient, provided with water and shelter, and improved by frequent top-dressings, and the sowings of clovers, and of stong

perennial grasses. The naturally very rich meadows do not require this assistance. The oldest calves will go to the grass paddock, and if the grass be scanty, assistance must be given in clovers and vetches that are placed in racks. A shelter shed and a supply of fresh water are indispensable.

The latest lambs will now require much attention; give them the best grass on the farm, in order to raise an equality with the foremost. Nothing more easily shows the good management of animals than the equality both in the breeding and in the condition.

The ewes and lambs that are eating the early vetches and rye must have fresh food every two days. Begin the soiling of horses and cattle in the yards, and milch cows also, if the pasture is not abundant. Feed the store pigs with clovers and vetches, and afford ample littering to all animals. As the early soiling green crops are consumed, plough the land for turnips.

Put mares to the stallions, and geld colts, though this operation may be more safely performed the previous autumn.

Finish the sowing of grass seeds on barley tilths. Sow by machine, and cover with light harrowing and heavy rolling.

Dig hop plantations, and tie the bine to the poles. Shut up watered meadows for hay.

Wash sheep by hand in a clear running stream, and to prevent the maggot fly sprinkle the animal from head to tail from a dredging box, with a mixture of hellebore root powder, and of black brimstone, $\frac{1}{4}$ lb. to $1\frac{1}{2}$ lb.

Weed young quicksets in hedges, not to expose the roots too bare to the sun's rays in dry situations; rather leave the weeds to moisten the roots, provided the upward growth of the thorns be not checked.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Commence with sowing kidney beans for a full crop in July. Repeat in the third week.

Sow scarlet and variegated runners over a layer of decayed mixed dung in hollow trenches a few inches under the earth. Return the soil over the manure, press it moderately firm, and sow about three inches below the upper surface level, covering to that depth with light earth. Dry and searching weather has shown the utility of this deposit, as the plants never have flagged over it. Sow cucumbers on a ridge over manure. Repeat all the sowings

of last month, except the tap-rooted plants, in order to keep up successional supplies. Suffer no weeds to grow: Dutch-hoe and rake every portion of uncropped land.

FLOWER GARDEN.

Sow annual seeds in borders; and propagate, by slips and cuttings, wallflowers and rockets, and place a glass over, to shade them.

Stir the surface of all grounds, when nearly dry, after heavy rains; attend to give air and water in all glass covers.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR APRIL.

During the greater portion of the month the weather has been otherwise than favourable to the progress of vegetation. The long continuance of easterly winds has imparted an unhealthy appearance to the young wheat plants, which, in most counties, are unusually backward for the time of year. In reference to the quantity of land under wheat culture this year, it seems to be the general impression that it is considerably less than in 1860. We are aware of numerous instances in which it has been found necessary, owing to the scarcity of the plant, to replough the land, for turnips; nevertheless, our opinion is that the actual falling off is much less than some persons imagine. What better or more paying crop than wheat can now be grown in this country, notwithstanding that there is every prospect of immense importations from the continent and elsewhere? Even assuming that the next crop of wheat will be a full average one, and of good quality, prices must of necessity rule high, because we have no old stocks to fall back upon to meet the demand. The sowing of Lent corn has been brought to a close.

There has been a steady consumptive demand for all good and fine wheats; but low and damp parcels have commanded very little attention, on easier terms. The sale for all descriptions of spring corn has continued in a healthy state, and in some instances the currencies have had an upward tendency.

The reduction in the price for accommodation, at the Bank of England, has, of course, been followed by a corresponding fall in other quarters. Notwithstanding that money is still somewhat dearer than could be desired, the commercial operations of the country, both for home use and export, have increased to some extent, and prices have somewhat improved. Increased commercial prosperity must lead to an increased consumption of food: so that the corn trade is likely to be benefited to some extent by an active sale for goods in the manufacturing districts.

Since the close of the public sales of colonial wool in London, and at which a considerable fall took place in prices, the wool trade has shown signs of improvement. In the quotations, however, no change has taken place. The next sales will commence on the 9th of May, when upwards of 50,000 bales will be offered. Last year, the May auctions amounted to 72,000 bales. The quantity of the new clip of English wool as yet brought forward is small. We observe more disposition on the part of foreign buyers to operate in an article which is now criering at comparatively low rates.

The metropolitan and most other markets have continued to be well, in some instances heavily supplied with potatoes in excellent condition. Surprise has been expressed in many quarters at the enormous quantities which continue to find their way to London at this period of the year; but the fact is now patent to all immediately interested, that last year's aggregate produce, especially in Scotland, was considerably larger than was somewhat generally anticipated. The comparative abundance of potatoes has, of course, had considerable influence upon the value of better kinds of food.

Hay and straw have come forward somewhat freely. The demand for them is somewhat restricted, as follows: Meadow hay £2 to £5 5s., clover do. £3 10s. to £6, and straw £1 14s. to £2 per load.

Letters from most parts of the Continent state that agricultural use is in a very backward state. The supplies of produce on offer in the various markets, however, continue large, and the demand on English account has somewhat fallen off.

A question of considerable importance has sprung up in reference to the actual supply of wheat in the hands of our farmers. On the one hand, owing to the large number of stacks in some counties, it is contended that the quantity is large; on the other, that the deficiency in the growth is an extensive one. We believe that there is, at least, one-third less wheat on hand than at the corresponding period in 1860,

and, further, that the deficiency in quality is a most serious one.

The supplies of barley, beans, and peas appear to be seasonably large; but those of oats are unusually small; consequently, the consumption in the agricultural districts is now principally met by foreign importations.

The transactions in produce generally, both in Ireland and Scotland, have been on a moderate scale, and prices have shown a tendency to give way.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that our leading markets of consumption have been seasonably well supplied with beasts, both as to number and quality, the demand for most breeds has ruled steady, and, on the whole, prices have been fairly supported. The Norfolk and Scotch supplies of beasts disposed of in the Metropolitan market have appeared in admirable condition; indeed it may be doubted whether better stock, in such large numbers, has ever made its appearance in London at this period of the year. Other English counties have contributed their full average quota, and certainly in fair condition. Sheep have come to hand somewhat freely; but we regret to state that numbers of them have been suffering from the effects of foot rot; even many of the best Downes have shown signs of the disease to some extent. The arrival of lambs has been only moderate, and, with some few exceptions, their general weight and condition have fallen short of many previous years. The result is that really prime lambs have commanded high rates. There has been a good consumptive demand for both calves and pigs, at full quotations.

Our advices from most of the leading grazing districts are to the effect that beasts have done well, although the quality of last year's food has turned out very inferior. Sheep, however, have continued to show signs of rot, especially in low districts, and it is therefore imagined that they will command high rates for some time, even though we may import liberally from the continent. As far as we can understand the general bearings of the trade, viewed of course in relation to the demand, our impression is that the value of all kinds of stock will continue firm during the whole of the year. What, in point of fact, is likely to reduce it? Evidently we are not in a position to over-supply the markets, and unquestionably the consuming powers of the people are in excess of production, however artificially it may be conducted.

There appears to be a large number of sheep in Holland ready for shipment to this country; but the prices demanded for them are too high to admit of speculative operations; hence shipments will continue to be made on owners' account; but not, we apprehend, in larger numbers than can be easily disposed of.

The total importations into London, during the month, have been as under:

					READ.
Beasts	..	..	..	..	1,604
Sheep	..	..	..	..	8,140
Calves	..	..	..	..	837
Pigs	..	..	..	..	538
Total	..	..	..	..	11,119
Same time in 1860	..	..	..	..	10,489
1859	..	..	..	..	8,888
1858	..	..	..	..	5,998
1857	..	..	..	..	4,814
1856	..	..	..	..	1,924
1855	..	..	..	..	4,253
1854	..	..	..	..	4,760
1853	..	..	..	..	14,787

The foregoing comparison shows that we imported a full average number of foreign stock last month.

The total supplies of home and foreign stock exhibited and disposed of in the great Metropolitan Market have been as follows:—

				HEAD.
Beasts..	..	..	..	17,140
Cows ..	..	..	..	510
Sheep and lambs	..	..	..	102,630
Calves..	..	..	..	497
Pigs ..	..	..	..	2,662

COMPARISON OF SUPPLIES.

April.	Beasts.	Cows.	Sheep and Lambs.	Calves.	Pigs.
1860.....	18,512	489	114,450	1,848	2,140
1859.....	16,850	390	110,114	420	1,990
1858.....	17,950	400	104,380	1,332	2,097
1857.....	18,601	460	92,810	1,240	2,025

The arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire last month amounted to 10,800 Scots, crosses, and shorthorns; from other parts of England, 3,000 various breeds; and, from Scotland, 1,325 Scots and crosses. In the corresponding month last year the arrivals of Scotch beasts were confined to 600 head. Since we last wrote no beasts have made their appearance from Ireland.

Beef has sold at from 3s. 4d. to, in some instances, 5s., mutton 3s. 6d. to 5s. 10d., lamb 6s. 4d. to 7s. 8d., veal 4s. 8d. to 5s. 8d., and pork 3s. 10d. to 5s. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	April, 1857.			April, 1859.		
	s. d.	s. d.		s. d.	s. d.	
Beef from	3 4	to 5 0	....	2 10	to 4 2	
Mutton	4 6	to 6 2	....	3 0	to 5 0	
Lamb	5 10	to 7 4	....	6 0	to 7 0	
Veal.....	3 8	to 5 10	....	4 0	to 5 4	
Pork.....	3 8	to 5 0	....	3 0	to 4 4	
	April, 1859.			April, 1860.		
	s. d.	s. d.		s. d.	s. d.	
Beef from	3 4	to 5 2	....	3 4	to 5 0	
Mutton	3 6	to 6 0	....	3 8	to 5 10	
Lamb	5 4	to 7 0	....	5 6	to 7 8	
Veal.....	3 10	to 5 8	....	4 8	to 6 0	
Pork.....	3 0	to 4 2	....	3 6	to 4 10	

The arrivals of meat up to Newgate and Leadenhall markets have been on an extensive scale, especially from Scotland and the North of England. Prime beef has realized 4s. to 4s. 4d.; prime mutton, 4s. 8d. to 5s.; and very prime pork as much as 5s. 4d. per 8 lbs. by the carcase.

SOUTH LINCOLNSHIRE.

The usual anxieties incident to the transition from Winter keeping to Summer grazing have been somewhat increased by the prevailing cold winds and recent sharp frosts. All vegetation is backward, and the stock of mangolds is all but exhausted; hence great difficulties arise, and much privation will result in the management of stock for the next few weeks. We have a good proportion of straw left, but very little hay; consequently, the fold-yard stock will require an increased ration of cake, as they must be kept up to the mark in condition immediately before and up to the time of turning to grass, or danger will follow from weakened digestive powers on fruitful herbage. The chief business of the farmer just now is the planting of his potato crop; and no little difficulty is experienced in preparing the land for its proper reception. The land was so saturated with rain during the past wet and cold Summer as to cause it to work tough and unkindly. It is almost impossible to reduce it to a fine mould; hence many growers are planting upon a "chequery" soil—a dangerous experiment; but should the season prove suitable, a good crop may be expected. The favourite mode of planting this year appears to be on the ridge system. The ridges are thirty inches apart, slightly manured with fold-yard dung, and further aided by sowing along the opened ridge in which the potatoes are to be planted about $\frac{3}{4}$ cwt. of Peruvian guano per acre. The sets are placed along this bottom at from 12 to 14 inch intervals, the ploughman opening one ridge and closing up another in his bout. Many fears are expressed

relative to the safety of the Spring-sown crops; more particularly of the bean and peas crop. At present they show no sign of a good plant, and upon examination it is found to arise chiefly from decayed seeds or grains. The seed has vegetated, and put forth both a root and a shoot; but generally it is seen that the shoot has become decayed, and the root appears ready to follow it, which, in fact, it will soon do. There appears at present no prospect of being able to improve these crops, as the surface is so hard on most soils that destruction must ensue from rolling, and it is so close and set at top that no tender plant can force its way through. Wheat hoeing is begun in some places. The crops with but few exceptions are very thin in plant, and very backward. Fallows were never backward in any season; and farm work generally is "far behind hand." Every department of Spring work has required much extra labour, which has had the above effect; and should these dry, searching winds continue, we shall still lag behind. Our Spring markets and fairs are well attended, and all kinds of stock rule high in price. Good hoggets fetch 45s. to 70s. per head. Wool continues to uphold a high figure, and long wools will be scarce. The meat markets continue high in price, and without much hope of reduction. We never knew such a paucity of fat stock. It is with some difficulty that the requirements of this thinly populated district are supplied, although essentially a fattening one. We never knew a larger number of stock sales taking place than in this season. This does not speak well for the prosperity of this division of the county. Unquestionably the losses have been severe, owing to the three previous harvests being so defective—the two last woefully so; and to this add the loss of the potato crop of last year. If it had not been for the retrieving circumstance of its being a favoured grazing district, the consequences to the occupier would have been ruinous. We are hopeful for the future, but the prospects are by no means encouraging. Wages are good, and expenses increase, so that the farmer has much to meet. We trust that a more propitious Summer will providentially be given to us, and thus lead us to know and feel more from whence our blessings come.

ISLE OF ELY.

The cold weather still lingers, and the periodical N.E. winds of April produce all their wonted influences both upon our persons and our fields. We never heard any one say they enjoyed these chilling, piercing blasts, and they have never been famed for making grass plentiful, or corn fields luxuriant; but they are annual visitants, and we have to make the best of them while they stay, and ever and anon we bid them a sincere and hearty farewell when they leave. We are the best friends when furthest removed from each other. Last week we had three severe frosts and three warm sunny days. These combined exerted an unfavourable influence upon vegetation, and very much retarded its progress. Our report of the growing wheats must still be unfavourable. In a few instances, upon the warm gravelly fen soils, the plant is promising, and presents a beautiful and healthy verdure; but upon the generality of land it is far otherwise. The plant is thin and looks sickly, and the frosts of last week have given it a very unhealthy and unpromising aspect. Unless we get a speedy change of weather, with more genial and Spring-like temperature, our worst fears as it regards the wheat crop, must inevitably be realized. Oats have come up well, and look strong and healthy; and if they escape the ravages of their old foe the wireworm during the next few weeks, there is every prospect of their making a crop. Beans are not generally so good. We have heard to-day of some having been ploughed up. The seed sown, in many instances, was immature and in bad condition, and has rotted in the ground. Where good seed was used the plant is looking very well. In another week we shall begin to sow mangolds, and it will behave our farmers to be very cautious in the purchase of seed. Some are very good, and others are comparatively worthless. We sowed 20 seeds we had from one party, and have 42 plants growing from them; and we sowed 36 seeds of another lot, and have only 2 plants. Such is the difference this year. Grass was plentiful when April came in; but the frosts and cold weather have checked its growth. The corn trade is very bad again. For two or three weeks

we had a fair sale for our fen wheats, but the demand has again subsided.—YOUR FEN REPORTER.—April 15.

EAST SUFFOLK.

In reporting the growing crops in this locality, the month of March was partly wet, which is considered unfavourable for wheat, yet on the whole this cereal is looking healthy, and promises well. On some heavy clay soil the slug has taken it off in places. The usual acreage is sown. Last year's crop proves a very defective yield; and an extensive inroad has been made in thrashing it out, although the price is unsatisfactory. A small portion only of barley is yet sown; but with favourable weather will soon come to a close. The last crop, like wheat, is a bad yield. A small quantity remains in farmers' hands.

SOMERSETSHIRE.

May weather has commenced in April this year, and very grateful to have such beautiful sunshining or with little interruption. The greatest heat was on the 17th, 70½ degrees, and 34½ was the lowest for the past three days. There has been for these few days marked progress, and the spring birds are announcing themselves; the cuckoo is very punctual on or before the 20th, but as yet there has not been the number arrived as in some years, and all our winter birds show a falling-off without exception, proving last winter was fatal to a great many of our feathered tribe—the robin, thrush, starling, and rook are evidently lessened in number; but what is, perhaps, less explainable, the small slugs are very plentiful; the severity of the winter does not appear to affect this family. Much of the damage to the wheat plant may be traced to them. Some pieces have to be ploughed up, others are very thin on heavy soils, and have been partially resown. We do not estimate the quantity put in as equal to last year, which was considered less than the previous one, as this year there has not been so little autumn snow. "April" has lately been enquired for, and there will be grown more than last year. None of the wheats are forward: but we may have an average crop, and an earlier one than the last year's. Beans have come up well, and the winter ones, although backward, promise fairly. A good deal of barley has gone in, and is now waiting for rain. The land will now be in fine condition, if we have rain in about a week. There is a prospect of a much earlier spring than last year, and a dry summer not unlikely to follow. There is a shortness of sheep keep; the roots have not held out well, and on all the winter food there is not that pressure usually found. The artificial grasses are looking worse; a good plant of clover; and the meadows are forwarder than last year at this time. The hay has held out better than was expected. There does not appear much likelihood of a fruit season; the pear is in bloom, but sparingly, and the apple, although more backward, will be a very partial blossom. Potatoes have gone in pretty freely; but on the field there is still more to do. Sheep have been very badly kept, and there is not full confidence; still good hogs fetch high prices—prime 40s. to 45s., but under 40s.; there are few of prime quality in fair condition to be bought: those not warranted are very low, from 15s. to 20s. per head. Our graziers have bought up to their means or food. If the grass grows fast, there will be more doing. Prices have been steady, but much lower than last year for inferior. There are a good many barreners; and good cows and calves sell high. Up to this time there has been much complaint of short produce from the cows come in to milk; and the price of butter has been high, 14d. to 15d., it is now down to 1s. Cheese has been selling badly, and prices have given way 4s. to 5s. per cwt., in some instances more; but the stock is considered light, as the make last year was very short. Beef keeps fairly up, and so does good mutton, and mostly fetching 12s. to 13s. per score, and 8d. to 9d. per lb. Fat pigs have kept up to 10s. and 10s. 6d.; poor ones are rather higher. Wheats have not got up equal to London, as for best whites nearly as much is given as before the late falls. We are not largely supplied; the condition lately much improved, from 6s. 6d. to 7s. 8d. red, 6d. to 62lb., white 7s. to 7s. 9d., in fair condition; inferior difficult to sell, so that there is by no means a large stock in farmers' hands, hardly an average; but the quality will not tempt them to keep over, as the price makes it safe.—April 19.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BANBURY FAIR.—There was an average supply of stock, both in the beast and sheep markets. Beef fetched from 4s. 6d. to 5s. 2d., and mutton from 5s. to 6s. per 8lbs. In the horse fair Mr. Cother had an auction of several fine entire cart horses. One of them, a dark brown three-year-old, which took the first prize at the Chipping Norton Agricultural Meeting, was knocked down at £80.

CASTLE-DOUGLAS MARKET.—This being the day of our annual hog show for Penrith Market, it was expected that it would have been a fair one. The state of the weather, however, having of late taken so propitious a turn as to almost insure abundance of keep, has told against a large show, and therefore we have to report a very indifferent one. The demand, however, for hogs of each class in fair condition was good. Prices ranged from 48s. to 40s. per head for half-breds, and from 31s. to 35s. for crosses.

CHESTER FAIRS.—There was a large show of horses, but very few changed hands. Buyers attended in considerable numbers, but, as prices ruled high, few purchases were effected. Business was more brisk in the cattle fair, the rates in some instances being in favour of the buyer. On the whole the prices for every description of cattle were the same as last quoted.

CROWLE SPRING MARKET.—The show of beasts and pigs was not so good as on former occasions, and business amongst them was only flat.

DODBROOKE MONTHLY MARKET.—There was an average supply of cattle, with a good demand, beef fetching from £3 5s. to £3 10s. per cwt. A moderate supply of mutton, with a slow sale at 8½d. to 8¾d. per lb. Mr. Pedler, of Sherford, sold 50 wether hogs at 52s. 6d. each.

GLOUCESTER MONTHLY MARKET.—The supply of beef and mutton was unusually short, and the trade was therefore brisk, while former prices were fully supported. Beef ruled from 7d. to 7½d., mutton in the wool from 8½d. to 9d., and shorn sheep from 7d. to 7½d. per lb. Pigs were sold at from 10s. 6d. to 11s. per score.

HOLY CROSS FAIR.—There was a larger supply than usual of all kinds of stock. Barren cows sold from £9 to £12 each, fat wethers £3 each; fat pigs from 10s. 6d. to 11s. per score. Some good horses met with a ready sale.

HONITON GREAT MARKET.—There was a large attendance of dealers and farmers, and a great quantity of cattle and sheep driven in, but very few changed hands in consequence of food being scarce.

HOWDEN FAIR.—There was a good supply of horses. The best sorts met a ready sale at good prices; for second quality and inferior animals there was a dull market. The cattle fair had a fair supply, and prices ruled quiet.

LESLIE SPRING MARKET.—Fine fat brought about 10s. per stone. Some idea of the general prices may be formed from the following sales:—A fine lot of fat stock was sold at £27 per head. Mr. Young, Bakedie, sold a lot (six) of two-year-olds at £8 11s. per head. Captain Murray, Kinglassie, sold ten two-year-olds at £10 per head. Mr. Elder, Wells-green, sold a lot at £9 5s. a-head. Mr. Beveridge, Kinniston, sold a large lot at £12 12s. a-head. Mr. Black, Tillobreck, sold a pair of calving queys for £27. Mr. Bogle sold five queys at £12 a-head; and Mr. Barclay, from the neighbourhood of Kinross, sold to Mr. Arnot, Bowhouse, a lot at £10 a-head.

LUTON FAIR.—A large quantity of lean beasts, cows, heifers, and calves. High prices were asked and given for the best breeds and sizes. The chief were short-horns, Welsh, and Devons. Five three years old stores made from £12 to £14 per head, second rate ditto £7 to £9 ditto, small ditto from £5 to £6 ditto, cow in calf from £16 to £20 each, others at from £12 to £15 ditto, heifers at from £10 to £14 ditto, calves at from 20s. up to 50s. each. The majority of every description found buyers. A large quantity of sheep was penned. Of southdowns and half-breds, fat and lean, sales brisk and prices high; best store tegs made from 34s. to 38s. each, couples from 36s. to 44s., lambs at from 16s. to 22s. each. Fat sheep: wethers at from 5s. to 5s. 4d. per stone, second quality from 4s. 6d. to 4s. 10d. ditto. Pens all cleared out early. A greater number than usual of riding, driving, and draught horses, with small droves of Welsh and Irish

ditto, prices high and sales brisk. First-rate nags made from £40 to £45 each, cart horses from £20 to £40 ditto, Welsh colts from £14 to £18 ditto, ordinary ponies from £10 to £14 ditto.

NEWTON-STEWART MARKET.—Three-year-olds sold from £8 to £10 each, two-year-olds £7 to £8, cows £6 to £12, and the others from £3 to £5 each. Of pigs the number was about an average, ranging from 10s. to 12s. 6d. each, according to age and quality.

SHIPSTON-ON-STOUR FAIR, so famed for cart-horses, was numerously attended by dealers from all parts of the kingdom. There was an excellent show of useful draught horses, which realized prices varying from 30 to 75 guineas, and were re-sold at higher prices. The cattle fair was also well supplied, and there was a good demand for stores. Mr. Print, of Wolford, disposed of some tegs at 54s. a-head. There was likewise a good demand for beef and mutton, and on the whole the fair was a thorough business one.

ST. COLUMB MONTHLY MARKET.—There was a small supply of fat bullocks and sheep, in consequence no doubt of the farmers being busy putting in their spring crops. The former fetched from £3 to £3 5s. per cwt., and the latter (there being only a few) from 7½d. to 8d. per lb.

THORNBURY MONTHLY MARKET.—There was a good supply of capital fat beef, which sold readily at from 60s. to 70s. per cwt. There was also a large supply of good grazers, which were soon disposed of at prices varying from

£14 to £18. Some useful in-season heifers and heifers with calves were also offered, and these found ready sale at prices from £16 to £20 each. The supply of fat mutton was short, but good store sheep were plentiful, and a good trade in this department was done; mutton 8½d. to 9d. per lb. Pigs were as usual very plentiful, and business good; bacon 10s. 6d. to 11s. per score.

WEYHILL FAIR.—The number of sheep much exceeded the expectation of all who attended this market, and a good clearance was effected at an advance from 2s. to 3s. per head from late fairs. Couples sold from 36s. to 46s., tegs from 26s. to 36s.; prime lots at much higher prices. Mr. Child, of Weyhill, obtained the high price of 55s. per head for a very prime lot (100) of wether tegs. In the cattle fair, although a great quantity was brought for sale, the supply was not equal to the demand, and many lots exchanged hands over and over again. There was also a great number of horses, which sold at high figures.

WORCESTER FAIR.—The supply of beef and mutton was good. There was a great attendance of buyers, and all kinds of stock sold readily at an advance. Beef brought 7½d. to 8d.; mutton, shorn 7½d. to 8d., in the wool 9d. per lb. Ewes and lambs of the best quality sold briskly at good prices. Good cows and calves fetched from £15 to £20; barrens were greatly looked for, but few on offer. Good business done in fat pigs, which realised 10s. 6d. to 11s. per score. A good many horses offered, but very little business done.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The want of dust in March has been nearly made up in April, dry and cold weather having prevailed. After the long prevalence of wet, nothing could be better for the tillage and seeding of the ground; and farmers have, therefore, taken every opportunity to make up the serious amount of work in arrears. The wheat plant has, however, made but little progress, the frosty nights keeping it back; and with the slow growth made, its thinness and the numerous blanks have become more visible—so visible as generally to show the error committed in trusting to last year's seed. In many cases it just had strength to vegetate and die; while those who used sound one-year-old seed have generally found healthy plants in spite of the roughness of the weather. What a warm season may do for the yet surviving plants time will show; but, with very few exceptions, there is no promise of even an average yield. Oats are said to come up strong and well in many places; and the spring-sown wheat, as well as most Lent corn, are promising; but if the weather prophets are in the secret of the future, there is another agricultural struggle in prospect against the elements. But let us hope that He who "guides Arcturus and his sons," and has ordained the seasons, will be propitious, and order all things well.

The early opening of the Baltic by steamers has brought about a temporary depression in the wheat trade, and, beyond this influence, the prospect of a free trade in corn throughout France has produced its effects; but as our neighbours, like ourselves, had a poor crop last year, as well as unfavourable seedtime, with frosty nights, their prices lately have rather improved, and the amount

of our own decline for good new English wheat has not exceeded 1s. to 2s. per qr., the scarcity of old, both English and foreign, keeping up the rates. The late shipments from the Baltic being principally of last year's growth, were mostly inferior and damp; holders were therefore disposed to accept the first loss rather than land, and hence there was some pressure on the market: but the unfavourable result is calculated to reduce the number of shipments, and already we see this consequence even with favourable winds. The qualities required, viz., fine dry heavy samples, appear nowhere abundant but in America. Odessa has not yet received her best supplies. The Mediterranean ports are generally dependent on the Black Sea, and it is only the North of Spain that can give any quantity, and prices there are too high for this market. The certainty that more would be wanted at New York, with the prospect of the reopening of the canals, has lately produced more buoyancy there; but with the civil war now commenced, though prices have since rather receded, but little dependence can be placed on a continuance of heavy shipments. We do not, therefore, anticipate much reduction on present rates, even with fair weather; but, with any serious change either on this score or in European politics, there is yet room for a considerable advance, as our own miserable crop is being fast used up, as well as the stocks of good foreign corn; and there is no available resource to fall back upon, in case of need.

The following prices show the state of foreign markets. The best wheat at Paris was worth about 62s. per qr., second quality 61s., at Louvain 61s. to 62s. also. Rotterdam prices varied from 35s.

6d. per qr. for low native quality, to 70s. for fine foreign red. At Geneva, fine old wheat was worth 63s., new 60s. The best Bavarian at Mayence 53s.; kilndried red at Groningen 52s., white 55s.; fine Saale and Wahren at Hambro', 58s. to 59s.; fine Danish, 58s. 6d. At Cologne, the top price was 54s. to 55s. per qr.; at Mayence, 53s. Rates varied at Odessa from 43s. 6d. to 53s. 6d. At Galatz, the best wheat of the country was quoted at 35s. 6d. At Constantinople, 43s. 6d. to 59s. 6d. per qr. Soft wheat at Genoa was worth 51s. Notwithstanding very promising crops at Algiers, hard wheat there was worth 51s. per qr., and 53s. to 55s. at Oran. Choice Blanquillo wheat at Santander was 64s. per qr. At New York, Chicago spring wheat was quoted about 41s. per qr., red winter Western 46s., white 48s. to 52s. per qr.

The first Monday in London opened on the back of large foreign and moderate English supplies. During the morning, very few samples appeared from Kent and Essex, and these were in miserable condition, the month of March having closed wet. There being no fine English at market, rates were unaltered. The trade in foreign was very much of a holiday character, but there was no giving way on the part of factors for fine qualities. With good arrivals off the coast, sales proceeded without change of value. A holiday influence was observable throughout most of the country markets, both in the character of the supplies and business done. Newcastle, Hull, Birmingham, Lynn, Newark, Bristol, and Gloucester were unaltered, and though Ipswich and Spalding noted a slight improvement, Oxford quoted a decline on Saturday of 1s. to 2s. per qr. Tuesday at Liverpool was the same as the previous market, but Friday showed a decline of 1d. per cental. The Scotch and Irish markets participated in the decline.

The second Monday commenced with a heavy foreign supply undisposed of during the previous week, though the English arrivals were small. With a change to dry in the weather, the condition of the samples from Kent and Essex was improved, but the show on the stands was short. The quantity of foreign in poor condition, and pressed for sale, had, however, the effect of generally lowering prices 1s. to 2s. per qr. both for English and foreign new. Old being scarce were held at former prices, but sales were only to necessitous buyers. In cargoes arrived off the coast, sales could only be made by a submission to some decline. Most of the country markets followed the London decline, including Hull, Birmingham, Manchester, Boston, Lynn, St. Ives, Newark, Bury St. Edmunds, Bristol, and Gloucester; but Ipswich and some other places were unchanged. Liverpool was down 1d. to 2d. per cental on Tuesday, and rates were rather easier on the following Friday.

The third Monday again had a large foreign supply, the English being also rather better. The morning's show from Kent and Essex was small and condition much improved, but there was no life in the market, and the few parcels of fine new that

appeared went off at unaltered rates, but to sell inferior sorts it was necessary to take less money. There was a fair attendance from the country, and some little business was done in fine old foreign at former prices, but new was still difficult to place at 1s. per qr. reduction. Hull and many other country markets this week kept up former rates; but Birmingham, Stockton-on-Tees, and Sleaford noted a decline of 1s. per qr. Liverpool made no change in the quotation of wheat, either on Tuesday or Friday. Scotland and Ireland were also unaltered.

Though the foreign supplies were still good on the fourth Monday, they were not nearly so heavy, with but a limited supply of home-growth. The show this morning from the near counties were still small. Business generally was in calm, the scarcity of good English maintaining its value; but most of the samples showing being inferior, few were disposed of. Those who attended market from the country expected some concessions from foreign factors, but not obtaining them very little was done. With few cargoes off the coast, prices were unchanged. Notwithstanding a real but slight decline in prices throughout the country, the general averages show an advance from 54s. to 56s. 10d., but this only indicates the improvement in condition. The London averages exhibit the same feature of the trade, beginning at 56s. 9d. and closing at 59s. 2d. per qr.

The imports into London for the four weeks noted were, in English wheat 16,845 qrs., foreign 108,435 qrs.: against 22,892 qrs. English, 28,924 qrs. foreign for the same time in 1860. During the month of March the total imports into the kingdom were 551,791 qrs. of wheat, 687,743 cwt. of flour.

The flour trade, as is usual at this time of the year, has been dull and drooping, from the fear of bad condition, more especially after such a crop of wheat as last year's. The price of Norfolks opening at 40s. declined 1s. each, second and third Monday leaving the quotation 38s., but some holders would take this price. American barrels have also given way 1s. per bbl., leaving superfine at 31s., and extra double to 34s. Spanish 48s. per sack. The latter loses fully 2s. per sack to importers. The imports into London during the four weeks were 57,417 sacks English, 14,418 sacks 24,701 barrels foreign: against 70,101 sacks English, 705 sacks 269 barrels foreign in 1860.

The barley trade, so far as second qualities and those for grinding are concerned, has little varied, but the return of cold weather encouraging maltsters again to steep, making qualities, which were fast sinking in value, have had a temporary advance of 1s. per qr., which at this late period cannot be depended on. Other sorts have lately been better in demand, and it seems unlikely that foreign grinding will be cheaper, as it is now lower than oats, and the cheapest food that can be given. In the Mediterranean, stocks are light, and prices are too high to pay for shipments from the Baltic. The imports into London for the four weeks were 9,061 qrs. British, 28,235 qrs. foreign: against 10,437 qrs. British, 25,758 qrs. foreign in 1860.

MONTHLY RETURN.

AN ACCOUNT SHEWING THE QUANTITIES OF CORN, GRAIN, MEAL, AND FLOUR, IMPORTED INTO THE UNITED KINGDOM, AND ADMITTED TO HOME CONSUMPTION, IN THE MONTH OF MARCH, 1861.

Species of Corn, Grain, Meal, and Flour.	Imported from foreign Countries.		Imported from British Possessions out of Europe		Total.	
	qrs.	bush.	qrs.	bush.	qrs. bush.	
Wheat.....	550287	4	1503	7	551791 3	
Barley.....	222097	1	—	—	222097 1	
Oats.....	68515	5	3758	0	72273 5	
Rye.....	9225	6	—	—	9225 6	
Peas.....	12445	4	847	0	13292 4	
Beans.....	33787	0	—	—	33787 0	
Maize or Indian Corn..	130596	7	—	—	130596 7	
Buck Wheat.....	1	4	0	2	1 6	
Bere or Bigg.....	—	—	—	—	—	
Total of Corn and Grain	1026956	7	6109	1	1033066 0	
	cwts.	qr. lb.	cwts.	qr. lb.	cwts.	qr. lb.
Wheat Meal and Flour.	687679	0 16	64	0 25	687743	1 13
Barley Meal.....	—	—	—	—	—	—
Oat Meal.....	5358	3 0	425	1 0	5804	0 0
Rye Meal.....	185	2 7	—	—	185	2 7
Pea Meal.....	—	—	—	—	—	—
Bean Meal.....	3	0 0	—	—	3	0 0
Indian Meal.....	877	3 25	—	—	877	3 25
Buck Wheat Meal.....	—	—	—	—	—	—
Total of Meal and Flour.	694104	1 20	509	1 25	694613	3 17

HOP MARKET.

BOROUGH, MONDAY, April 22.—Our market continues to be firmly supported, with a steady demand for the best qualities of every date. Yearlings and the finest samples of the last growth are becoming scarce, and command rather more money.

Mid and East Kents.....	80s., 140s., 200s.
Weald of Kents.....	60s., 120s., 168s.
Sussex.....	60s., 80s., 126s.
Yearlings.....	110s., 140s., 189s.

MEASE & WILD.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, April 22.—During the past week the arrivals have been very large, both by rail and coastwise, and trade exceedingly heavy at reduced prices. Second-rate or inferior samples are unsaleable. The following are this day's quotation:—

Yorkshire Flukes.....	120s. to 150s. per ton.
Lincolnshire Regents.....	95s. to 105s. "
Dunbar red soil do.....	120s. to 160s. "
North Berwick do.....	115s. to 130s. "
Perth, Forfar, and Fife do.....	90s. to 105s. "
Ditto, do. do. Rocks.....	80s. to 85s. "
Ditto, do. do. Reds.....	70s. to 80s. "
French Whites.....	60s. to 80s. "
Belgian do.....	60s. to 80s. "
Dutch do.....	60s. to 80s. "

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, April 22.—Increased supplies of home-grown potatoes have been on sale here, but the imports from the Continent have been much restricted. Good and fine samples have changed hands steadily, at full quotations; otherwise the trade has ruled slow, at about previous rates.

York Flukes.....	130s. to 150s.
Scotch Regents.....	95s. to 125s.
Ditto Cups.....	80s. to 100s.
Ditto Rocks.....	85s. to 105s.
Dunbar Regents.....	160s. to 180s.
Foreign.....	65s. to 90s.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, April 22.—Our supplies are increasing, and prices have a downward tendency.

New Butter.....	116s. to 120s. per cwt.
Fresh.....	13s. to 15s. per dos.

WOOL MARKETS.

ENGLISH WOOL MARKET.

LONDON, MONDAY, April 22.—We have very little change to notice in the general features of this market. For good and fine wool there is a fair demand at full prices, but inferior kinds command very little attention. The new clip is coming forward somewhat freely.

Per sack of 240 lbs.

Fleeces—Southdown Hogs.....	£18 0 to £18 10
Do. Half-bred Hogs.....	19 0 19 10
Do. Kent.....	17 10 18 10
Do. Southdown Ewes & Wethers	17 0 17 10
Do. Leicester do.....	17 0 17 10
Sorts—Clothing, picklock.....	19 10 20 0
Do. Prime and picklock.....	18 0 19 0
Do. Choice.....	17 0 17 10
Do. Super.....	15 0 16 0
Do. Combing—Wethermatching..	19 0 20 0
Do. Picklock.....	17 0 18 0
Do. Common.....	16 0 0 0
Do. Hog-matching.....	21 0 22 0
Do. Picklock matching.....	17 0 18 0
Do. Super do.....	16 0 0 0

LIVERPOOL WOOL MARKET, APRIL 20.

SCOTCH.—There has been more inquiry for laid Highland Wool this week; but holders are now desirous to clear off old stocks before the new clip. There is no variation in price. White Highland is scarce, and inquired for. There is a fair inquiry for Cheviots, at about late rates.

Laid Highland Wool per 24lbs.	s. d.	s. d.
White Highland do.....	11 6 to 13 0	
Laid Crossed do.....	13 9 17 0	
Do. do. unwashed.....	14 6 16 6	
Do. do. washed.....	16 0 18 6	
Laid Cheviot do.....	18 0 22 0	
Do. do. unwashed.....	22 0 28 0	
White Cheviot do.....	34 0 42 0	

FOREIGN.—There is, considering the lightness of stocks, a fair business doing, at fully late rates. The public sales to commence on the 30th inst. will comprise about 10,000 bales East India, and 4,000 sundries.

FOREIGN AND COLONIAL WOOL MARKET.

	Per lb.	s. d.	s. d.
German, (1st and 2nd Elect.....)	3 4 to 4 6		
Saxon, Prima.....	2 4 3 0		
and Secunda.....	2 0 2 4		
Prussian, (Tertia.....)	1 8 1 10		
COLONIAL—SYDNEY—Lambs.....	1 2 2 3		
Scoured do.....	1 4 3 1		
Unwashed.....	0 9 1 1		
Locks and Pieces.....	0 9 1 8		
Slips and Skin.....	0 11 1 8 1/2		
PORT PHILIP—Lambs.....	1 2 2 7		
Scoured do.....	1 2 3 2		
Unwashed.....	0 8 1 0		
Locks and Pieces.....	0 6 1 9		
S. AUSTRALIAN—Lambs.....	1 6 3 2 0		
Scoured do.....	1 2 2 5 1/2		
Unwashed.....	0 8 1 1 1/2		
Locks and Pieces.....	0 1 1 1		
V. D. LAND—Lambs.....	1 4 2 2 2		
Scoured do.....	1 0 1 9 1/2		
Unwashed.....	0 1 6		
Locks and Pieces.....	0 1 7 1/2		
CAPE OF GOOD HOPE—Fleeces.....	0 7 1 11		
Lambs.....	0 10 2 0		
Scoured.....	1 0 2 1		
Unwashed.....	0 7 1		

MANURES.

PRICE CURRENT OF GUANO, &c.

Peruvian Guano, direct from importers' stores, £12 1/2s. to £12 1/2s. p. ton. Bones, £5 to £5 10s. per ton; ditto crushed, £6 5s. 4d. ditto dissolved, £6 10s. 4d.; ditto half-finch 19s. to 19s. 6d. per qr.; ditto dust, 19s. to 20s.

Animal Charcoal, (70 per cent. phosphate) £4 10s. to £5 per ton. Coprolite, Cambridge, in London, whole 42s. to 44s., ground 55s. to 56s.; Suffolk, whole 35s., ground 46s. to 47s. per ton.

Nitrate of Soda, £13 10s. to £14 10s. Gypsum, 30s. per ton.

Salt, according to quantity and distance, 25s. to 27s.

Sulphate of Ammonia, £14 10s. to £15 per ton.

Sulphuric Acid, concentrated 1°845 Id. per lb., brown 1°712 0/10d.

Superphosphate of Lime, £5 10s. to £6 6s. per ton.

Blood Manure, £6 5s. to £7 10s. per ton.

Limeless Cakes, best American, £11 5s. to £11 10s. (bri.), ditto £10 5s. to £10 10s. (bag) per ton.

Rape Cake, English, £5 5s. to £5 10s. per ton.

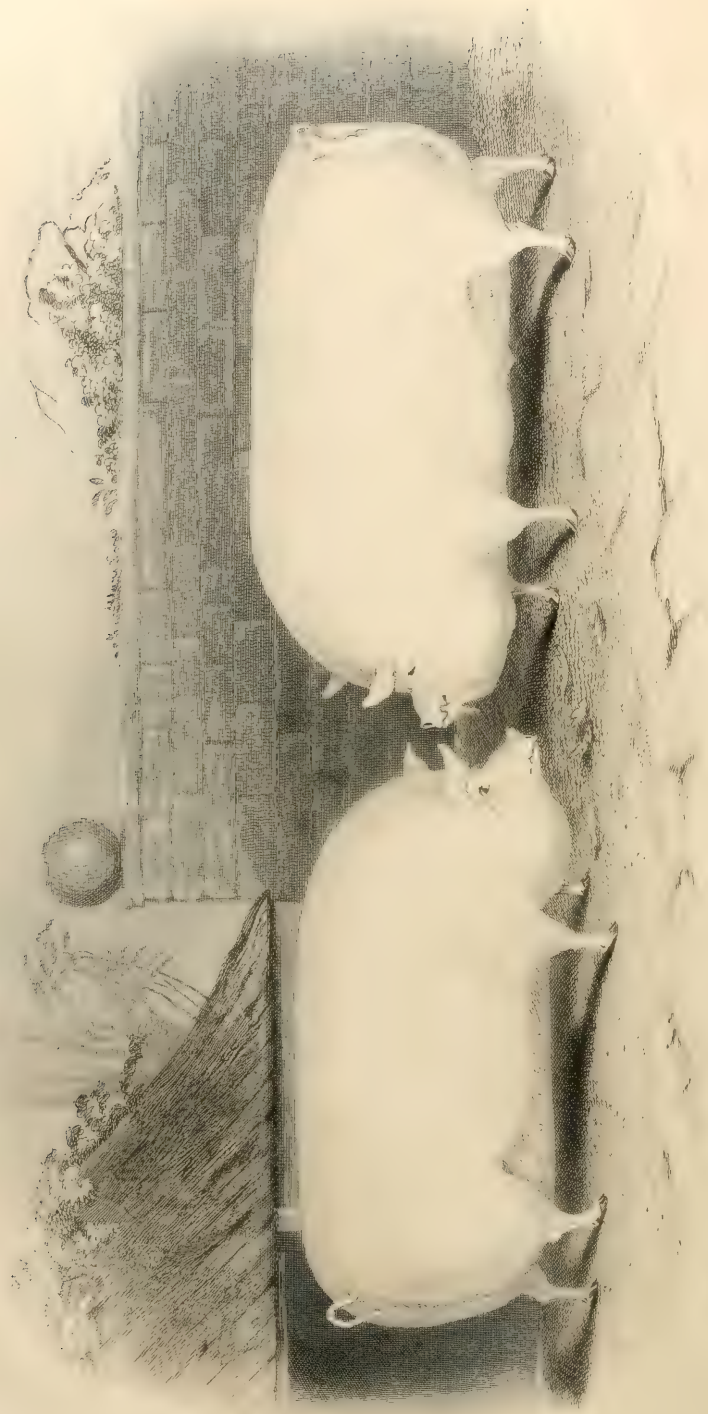
Marseilles Cake, £9 7s. 6d. to £9 12s. 6d. per ton.

E. PURSER,

London Manure Company, 116, Fenchurch Street, E.C.

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THE FARMER'S MAGAZINE.

JUNE, 1861.

THE PRINCE CONSORT AS THE PATRON OF AGRICULTURE.

Our readers will learn with real satisfaction that his Royal Highness the Prince Consort has consented to act as President of the Royal Agricultural Society for next year, when the Great Show will be held in the Regent's Park. This is on either side no empty compliment, but a really auspicious omen for agriculture. The advance of the art well merits such countenance, and the Prince's own tastes point at once to him as the proper patron of such an occasion as the Show of 'sixty-two promises to become. The world already knows of his Royal Highness' success as an exhibitor of stock; but it is not everyone who has had the delightful privilege of inspecting the Park Homesteads at Windsor, or of seeing and hearing how thorough an interest both her Majesty and her Consort take in the different phases of the Home, the Norfolk, and the Flemish Farms. With an enlightened and enlarged mind well fitted to his position the Prince gives everything in any way worthy of his attention a fair trial. We see this alike in the breeds of stock he cultivates and the different descriptions of machinery he employs. There are

those first favourites, the little Devons at one farm, the Herefords at another, and the Shorthorns at a third; with, moreover, an especial place for the dairy. The day on which we had the pleasure of going round there was a new grass-cutter on trial; while one of Smith's steam-cultivators has been at work at Osborne, and another of Fowler's at Windsor. Both the Queen and the Prince make it their care to see such inventions well tested, and the Royal pair are equally zealous in marking the improvement of the animals. The Prince is known to be a capital judge, and there is not a beast but that he has the history and value of at his command. With, then, his great abilities and natural predilections, we may repeat that his Royal Highness' acceptance of the President's chair should inaugurate a great year for agriculture. It will be the especial duty of the Society to make this worthy of him. There is an *éclat* already attached to the Meeting, that needs but careful cultivation to grow and thrive as time progresses.

PLATE I.

A DEVON HEIFER,

THE PROPERTY OF MR. RICHARD MOGRIDGE, OF MOLLAND, SOUTH MOLTON, DEVON.

This heifer, "Damsel" by name, and 1276 by number, was bred by Mr. Mogridge at Molland in April, 1857. She was by Duke of Sussex (406), out of Young Spot, by Abd-el-Medjid (an own brother to Abd-el-Kader), out of Lady (241), by Duke of York.

Duke of Sussex was by Napoleon (259), and Young Spot was an own sister to the Prince Consort's steer, which took the first prizes at the Birmingham and Smithfield Club Fat Cattle Shows in December, 1858. Mr. Mogridge, however, would seem originally to have had no such ambition with Damsel; or at any rate she had no great "preparation." When about two months

old she was put out to grass with the older calves, having twice a day three quarts of skim milk, and no further notice being taken of her. But early in the autumn, being thin and poor, she was taken in and kept on hay, turnips, or mangold wurtzel until the May of the following year, when she was again turned out to grass. During the next winter she was fed on coarse hay, and in the spring put to the bull. In January, 1860, however, Mr. Mogridge discovered that she was not in calf, and so began to feed her, with the intention of disposing of her to the butcher in May; but from her putting on fat so fast he was induced to reserve her for the Smithfield Show. Here Damsel not only carried

off the first prize of £15 as the best heifer not exceeding four years old, with of course the usual silver medal as an especial compliment to her breeder; but she was one of the reserved Graces over whom the judges long deliberated, like Paris of old, as to the award of the Golden Apple or Medal. It ultimately went against the Devonshire Damsel in favour of Mr. Hill's Hereford; but Mr. Mogridge was well pleased to know she stood even as high as this—a good second in a great show. He sold the heifer as she stood to Mr. Newton, of Tiverton. There was not an animal in the bazaar showed higher breeding, while her form was remarkably compact, her back surprisingly level, and her touch firm and mellow. As an illustration of the "little and good" there have been few better than Damsel.

Mr. Mogridge attributes his success as a Devon breeder to the opportunities which he and his fore-

fathers have had for nearly the last hundred years, of using the Quarty bulls. But, as he says of himself, "I was kept close to the plough when young, and I fear the young farmers that are now growing up are not taught habits of industry so as to judge what should be given for a fair day's work, or to decide what should be given for work generally on the farm. If the members of the Farmers' Club would teach their sons manual labour (*a little of it*) instead of cultivating hair and smoking tobacco, I think they would soon discover which was the most profitable piece work."

Mr. Mogridge should have sent his notions to Mr. Charles Howard a month or two back; or better still, have come up and expounded them himself. What is the relative cost and labour of growing a moustache, and spreading an acre of home-made manure?

PLATE II.

PRIZE PIGS,

THE PROPERTY OF MR. GEORGE MANGLES, OF GIVENDALE, RIPON, YORKSHIRE.

This boar and sow, both of the improved Cumberland and Yorkshire small breed, have won prizes at the meetings of the Royal Agricultural Society of England, the Highland Society of Scotland, and various other agricultural shows.

The boar "Brutus" was by the Squire, dam Miss Thornby, by Wellington, grandam Beauty, by Young Thormanby, great grandam by Wenlock, gr. gr. g. dam by Parker's prize boar, gr. gr. gr. g. dam by Bobby Shafto, gr. gr. gr. gr. g. dam by Old Dumfries.

The Squire was by Wonder, dam by Liberator, grandam by Peregrine Pickle, gr. g. dam by a boar of Lord Wenlock's. Wonder was by Castle Howard, and Castle Howard was by Sir George, dam by Nonpareil, grandam Countess, bred by Mr. Wiley. Liberator was by Gloucester, dam Beauty, by Lord Radnor's boar, grandam Julia Bennet, by Lord Galloway's boar, gr. g. dam by Mr. Hercy Croft's boar. Peregrine Pickle, by Young Thormanby. Young Thormanby was by Mr. Scott's boar, dam by Nutt's boar Samuel, g. d. by Dreadnought.

The sow "Blackeyed Susan" was by The Squire, out of Miss Brown 2nd, by Guy Fawkes, out of Miss Brown—Miss Brown out of Lady Wenlock, by Lord Wenlock, dam by Young Thormanby, grandam own sister to Wenlock, gr. g. dam bred by Mr. Higginson. Guy Fawkes, bred by Mr. Fawkes, was got by a boar of Mr. Eddison, of Leeds. Lord Wenlock obtained the first prize in 1850, at the Highland Society's Show, held at Glasgow; as well as at the Cumberland and Westmoreland Show at Carlisle; at Whitehaven and Cocker-mouth, with many other premiums at local shows, when a pig, in 1849. Thormanby obtained prizes in 1848, at the Highland Society at Edinburgh, at Cocker-mouth, and East Cumberland; in 1849 at the Royal Agricultural Society of England; at

Norwich; at Northumberland; at Cocker-mouth and Carlisle, having never been beaten. Wenlock gained the first prizes in 1846, from the Royal Agricultural Society of England, at Newcastle; a first at Wakefield, and another at Liverpool. Lady Wenlock gained the following first prizes in 1860, at the Highland Show, at Glasgow; at the Cumberland and Westmoreland Show, at Carlisle; as well as at the Cocker-mouth, and at Whitehaven.

"Brutus" was not only successful at Canterbury, but also took a first prize of the Highland Society, at Dumfries; a first and silver medal, as the best pig in the yard, at Keighley; a first at the Halifax and Calder Vale Association; a first at the Durham County Show; and a first at the Wetherby, at the Ripley, and at the Cleveland Agricultural Meetings.

"Black-eyed Susan" was successful at Canterbury, and also gained a first prize of the Highland Society at Edinburgh; a first at the Durham County show; first at the Cleveland Show, and finished off by taking a prize at the Birmingham Fat Show, where she was sold for twenty pounds as a fat pig. She measured seventy inches in girth and eighty in length, from between the ears to the setting on of the tail. The late show of single fat pigs at Birmingham was an unusually good class.

From the pedigree of Brutus it will be seen, that the Givendale breed of pigs has mixed up with it blood from the most noted breeders in England. If with shorthorns and horses so much value and stress is put upon pedigree, why should not a little value also be set upon the pedigree of that so long neglected animal the pig?

Since 1853 Mr. George Mangles has taken with the York—Cumberlands sixty-eight prizes and fifty-six commendations, including—at the Royal

Agricultural Society of England four prizes and twenty-two commendations; from 1853 to '59 at the Yorkshire, twenty-one prizes and eleven commendations; in 1859 and '60, at the Highland Society of Scotland, eight prizes; at the Northumberland county shows, eight prizes and five commendations; at the Birmingham fat shows five prizes and eleven commendations; at the Durham county shows, in 1859 and '60, four first prizes; at the Cleveland shows, in 1859 and '60, three prizes and one commendation; at the Keighley Agricultural Show, in 1860, the first prize and silver cup, for the best pig in the yard; and at the Ripley Agricultural Meeting, in 1859 and '60, eleven prizes; besides several prizes at the Wetherby, the Halifax, and Calder Vale Meetings.

We have much pleasure in adding the following practical paper from the pen of Mr. Mangles, on

THE BREEDING AND FEEDING OF PIGS.

Pigs, like all the other breeds of our domestic animals, have shared a little in the improvements that have taken place. The various railways have opened up a communication with all parts of England; and the different agricultural meetings in nearly every town have assisted to encourage this branch of our domestic animals by offering prizes for the several breeds. If any one looks at these breeds now, and compared them with the pigs of twenty years back, the improvement that has taken place will be found to be very striking: of all the breeds of animals the improved breeds of swine make the greatest amount of meat for the food consumed. The character of a pig is very soon altered by crossing, either for better or worse. I do not believe any other animal is so soon altered, and it is very difficult to keep a breed right—so that it is no wonder there are so many mongrel bred ones in the country, when there are so very few pure breeds kept distinct. One breeder, who wants his stock a little larger, uses a large-bred boar to his smaller sows: another tries black with white; and perhaps a third a cross of the Berkshire; and so on—intending, if the cross does not suit, to put the sow to a boar of her own breed the next time. He does not consider that the first boar a sow breeds to influences the succeeding litters for a long time. The proper way is to keep to one breed, and try to improve that sort by saving the largest and finest animals—though, if a good boar be kept in the neighbourhood of a bad-bred one, a shilling or two less will drive all the custom to the bad-bred one. The breeders little know the losses the feeders sustain when they come to fatten the animals; nor is it understood how many thousands of pounds are annually wasted in making bacon or pork from bad-bred pigs. A great outcry is raised that more and cheaper food is wanted for the increasing population; the land is forced to grow the most it can; and, until lately, the pig, together with the other domestic animals, had been but little looked after. I have heard some say, "My bacon stands me at 9s. the stone of 14lbs.;" another, "Mine cost me one shilling the pound;" and so on. Whereas I maintain that

bacon should be fed for less than sixpence the pound: if all that extra corn can be saved, or more bacon made, it must be a great advantage to the community at large. I know of several cases where a smaller grazing sort of pig has taken the place of the larger sort; but a very little meal has been required, with the wash from the house, to make those pigs weigh twenty stones each of 14lbs., where formerly sacks of corn were used. The feeders of such old-fashioned pigs have been astonished at the saving by the change of sorts.

About ten years ago I commenced pig-keeping on a larger scale than the generality of farmers. What I wanted, and what my farm required, was a quantity of good manure. I did not like the idea, after having spent a great sum of money in corn or cake, to be obliged to look to the muck-midden for pay for that food, as I am afraid a good many have to do. What I wanted was the manure free of all expenses, and what I have been able to get is manure free. With beasts I always had a heavy charge against the manure heap, but pigs I can get to pay for all they consume without taxing the manure. I first tried buying stores in the neighbourhood, but soon gave that up, as they were chiefly of the large breed, and required too much food and liberty. I had no alternative but to breed my own stores. With a view to find a profitable sort, I purchased a few of the best from different breeders of note, and kept them separate, and also a few stores of each sort together, living on the same kind of food. I also tried the different crosses; but, to get the cross, I must have pure stock at first; so I considered it best to keep to a pure breed. I tried the Essex, the black Leicesters, the Berkshire, the large Yorkshire, the small Yorkshire, and lastly the Cumberland small breed. I must confess at the outset I had but little experience to guide me: not understanding the principles of breeding, I committed many foolish mistakes, which I paid dearly enough for; and if these few lines should meet the eye of any one wishful to form and keep a breed of pigs, I shall be glad for such a man to profit by the experience of another. I never expected pigs to live on nothing; because the manure made from pigs living on nothing would be worth nothing, and it was good manure I was aiming at. I found any breed pay, except the large breed. All the crosses having the small breed for the sire always paid: whichever breed is intended to be kept, the best-bred ones should be obtained. I do not advocate breeding in-and-in; but I do advocate, if you want to maintain the same style of animal generation after generation, to cross with the same blood, but as far distant as you can get it. I do not know a better sign of pure breeding than a litter of pigs all alike, or three or four sisters breeding alike to the same boar. When the breed is obtained, one thing must always be kept in mind—the first boar a sow is put to influences the succeeding litters for three or four times.

After the breeding comes feeding and attention. Milk and fat must go in at the mouth before it can make its appearance in the animal. I do not believe those who say their pigs get fat on nothing. I know from experience that one pig will live where another would stare, and what would take to make

one large-bred pig fat would make several smaller-bred ones "up." A great help to profitable pig keeping is warmth, and confinement, and regularity in feeding; as by also keeping the skin of the animal clean by washing and brushing occasionally. If two animals of the same litter be put into two different sties, and have the same quantity of food each, the one that is kept warm and with the skin clean will gain more weight than the other. I found that out, one winter, when Jack Frost was astir, before I put up a new pig-shed. My man was feeding a lot of pigs alike, only some were in common sties and others in a warm shed. The difference was very striking: those kept warm fed nearly half as fast as the others. This induced me to build a long covered shed sixty feet long and eighteen feet wide, that would hold seventy porkers or fifty bacon pigs, where, when the thermometer has been below freezing point outside, it has inside been very warm and comfortable. The pigs have their food warm in winter, and are never starved by the cold: they are bedded with clean straw every other day, and the shed is kept rather dark. The manure made is of first quality, and fit to use for turnips.

Perhaps some of the readers of this paper would like to know a little about the dietary of my pigs. I have not included sugar in my list of feeding ingredients. I have never gone higher than new milk, which they always take without sweetening. In the first place, I must say I exhibit at a few of the leading agricultural meetings, and I am generally, if not at the top of the ladder, not many spokes off. I keep my breeding stock different to my show stock, as I do not like breeding animals to be over-fat; but show animals are obliged to be fat, or the judges will pass them over. The over-feeding of prize animals is a very great evil, but one that cannot be very well remedied. A show of lean breeding animals would be a very *lean* show indeed in many respects: an exhibitor must always sacrifice some of his best animals to please the public fancy. I think there is less risk in fat breeding pigs than any other animal. I have had several very fat sows pig, and have never lost any. I gave them nothing but a very little bran and water a week before pigging, and but little after for a week, while I put a little castor oil in their food directly after pigging. I have the greatest trouble in reducing the male animals, as they will nearly hunger to death before they will part with their fat. I generally turn them into a large yard, and give them plenty of water and a wurzel or two every day, or turn out to grass in summer. To my regular breeding pigs and stores I am giving boiled rape-cake and barley-meal one feed a-day, and one feed of raw potatoes or wurzel; and if in summer, I turn them to grass, or soil them with clover in the yards. I never have any of the skin of my white pigs crack from eating clover. I soil a good many every year. A week or two before the sow pigs I contrive to put her into a loose box, with a railing round to keep her from crushing the pigs. I can

always tell when she is going to pig by trying if she has milk in the paps: if a sow gives milk freely she will pig any time. I then contrive to be, or have some one near at hand, to take the pigs away as she pigs them, as the sows are sometimes uneasy and will crush them. After she has pigged. I feed her with warm water and bran, and then give her the pigs and leave them; because the less they are disturbed the better. I always feed the sow sparingly at first, as I have sometimes found, when a sow has been fed too liberally at first, the flow of milk is greater than the pigs can take; consequently the ure becomes hard, and the sow is very uneasy, and will scarcely let the pigs suck her. If such is the case, the best way is to rub the ure well with the hand three or four times a-day. Small-bred sows are commonly very quiet and tractable. Generally, when the pigs are three weeks or a month old they will scour, if proper care has not been paid to the sow's feeding. I never could get a man that could get me a litter through without scouring. I have tried different plans, but the one I have found most successful is always to give the sow a tablespoonful of the following mixture in her food: Mix together 2 lbs. of fenugreek, 2 lbs. of aniseed, $\frac{1}{2}$ lb. of gentian, 2 oz. of carbonate of soda, and 2 lbs. of powdered chalk. The sow gets very fond of this, and the little pigs, too, like it. Give the pigs also plenty of cinder ashes to root amongst. I prefer oats, wheat, and a little barley ground together, for sows giving milk. I have never tried the sugar diet, but I have found new milk fresh from the cow work wonders in a short time. Warmth, cleanliness, and regularity in feeding, a little good food and often, are the main secrets in rearing young pigs. I never like to see food left in a pig's trough: just give what they can eat up, and no more. When pigs are put up to feed, they should be kept warm and quiet: five porkers or three bacon pigs are plenty together. The pen they are kept in need not be very large; but the pigs should be wrung, and a little fresh bedding spread about every second day. Pigs like to be kept warm, but plenty of fresh air must be allowed to circulate through the pens, or else disease will soon show itself. According to writers on the chemistry of pig feeding, it takes $3\frac{1}{2}$ lbs. of starch to make 1 lb. of fat; $3\frac{3}{4}$ lbs. of barley to make 1 lb. of live weight, and 5 lbs. of barley to make 1 lb. of pork. If pork can be sold at 6d. the lb. and barley bought at 1d. the lb., there is plenty of profit in pig feeding, if the sort be a good one; and there is a certain stage in the feeding of a pig when very little weight will be gained for the food consumed. The last five or six years I have suffered very little from the disease incidental to swine flesh. By not transgressing Nature's laws, diseases have been very scarce in my herd of swine. The York Cumberlands seem to be very hardy, and not so susceptible of disease as the larger breeds. I once bought a large-bred boar that got all his stock subject to inflammation of the lungs.

PHOSPHATE OF LIME.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

It is very true that our forefathers made many grave yet ludicrous mistakes in regard to artificial manures; that they viewed with suspicion all novel dressings for their crops, and ridiculed those theoretical farmers who dwelt in cities—fellows who were merely members of the legal or medical profession. This was certainly the case—was perhaps the natural course of things. It was only at the commencement of the present century that the practical agriculturist began to mingle science with his rural inquiries—found out for the first time that grave philosophers might give him material aid in his difficult labours. The tardiness of this discovery is the more remarkable; since, before that period, almost all improvements in tillage came from those who were not educated as farmers—from men who now and then suffered their enthusiasm to carry them too far; it was so with the great Tull, who was a barrister of Gray's Inn. When that great friend of agriculture had discovered the advantages of his horse-hoe husbandry, he nearly arrived at the conclusion that all manure was needless. It is most amusing to read Tull's denunciation of dung, and his wonder at "delicate palates eating their own and their beasts' ordure, together with all sorts of filth and nastiness, a tincture of which those roots must unavoidably receive that grow amongst it." Tull's want of chemical knowledge was well and amusingly rivalled, when, about twenty years since, the use of bones dissolved in sulphuric acid was first suggested by Liebig. The advised application of sulphuric acid to the soil was forthwith denounced and ridiculed in every possible way. The very bones to which the mineral acid is now so extensively applied, had long to encounter the same opposition. There are yet men, I am told, in Sheffield, who are old enough to remember the time when the Yorkshire farmers were *paid* for carting away the refuse bones and ivory turnings of the Sheffield knife-makers. It is refreshing to refer to these bygone times; since, when we compare the knowledge of those days with our own, we may be cheered on by the reflection that the onward flow of knowledge has never yet given any indications of being stayed.

A recently-published series of researches, by Professor Voëlcker, on the phosphatic manures, appears in bold relief indeed to the state of our former knowledge, to which I have referred, of not yet a quarter of a century since. This reference we may the more profitably make, because now is the time when the manures for our root crops are generally employed, and almost all these have phosphate of lime in some form or other for their chief base. In this remark I am well supported by Professor Voëlcker, who observes (*Journ. Roy. Ag. Soc.*, vol. xxi. p. 350), when speaking of the phosphatic materials used in England for agricultural purposes: "Manure manufactories are now

spread over the length and breadth of the country, and in all these works the staple product, under whatsoever name it may be sent out, is in reality, in nine cases out of ten, superphosphate of lime. The consumption of this kind of manure, large as it is at present, is increasing every year, and is likely to increase for years to come. It must not be supposed that the large demand for phosphatic manures is the result of extraordinary exertions on the part of manure merchants, or is due to a prevailing, and it may be passing, faith in this class of fertilizers. It rests on the universal experience of farmers that no description of manure repays a judicious outlay so well as this, especially when applied to root-crops. Whilst other kinds of fertilizers have been tried on a large scale, and not been found to realize the expectations raised, superphosphate and similar phosphatic manures have maintained a firm hold in the good opinion of the agriculturist. Far be it from me to undervalue the great utility of Peruvian guano, nitrate of soda, and nitrogenous manures. These are excellent fertilizers for wheat and corn-crops in general; but considering the circumstance that a good root-crop lies at the very foundation of an improved system of agriculture, and that this crop is more signally benefited by phosphates than by any other fertilizing constituent, I believe the farmer is right in attaching the highest importance to phosphatic manures. At all events, he has found by experience that in most cases in which it is deemed desirable to make up a deficiency of yard-manure, it pays better to purchase superphosphate and similar manures for the root-crop than to buy nitrogenous manures for the white crops. It is certainly remarkable that whilst the direct application to the land of nitrogenous constituents has been by some considered useful only in special cases, and by others superfluous or even undesirable, nobody has ever expressed any doubt as regards the economical benefits that generally attend the use of phosphoric acid; whilst nitrogenous manures in the case of some crops, such as peas and beans and clover, have been found even to be injurious, every kind of produce has been more or less benefited by the direct application of phosphates in an available condition. Whereas ammoniacal salts and other purely nitrogenous fertilizers, when applied alone to swedes, turnips, and probably other root-crops, have, generally speaking, failed to increase the produce, the exclusive use of soluble phosphates has, in almost every instance, largely benefited these crops. Again, we can increase the proportion of nitrogenous constituents in the soil by other means than by their direct application in the shape of manure. Thus, after a good crop of clover, I have found that the amount of nitrogenous matters in the soil is very much larger than it was before the clover. If, therefore, we can succeed in growing a

good crop of clover, we at the same time enrich the land with nitrogenous matters, and provide for the succeeding white crop that kind of food for which it appears to be specially grateful. The fact that a good crop of wheat may be confidently anticipated after a good clover-crop is generally admitted; the power of the clover to accumulate nitrogenous matter in the soil, which explains this result, may not be as fully recognised. Moreover, whilst few soils contain more than traces of phosphoric acid, nearly every kind of agricultural produce contains this acid in very large and often preponderating proportions; its presence being further required to furnish the phosphorus which largely enters into the composition of albumen, gluten, legumine, and indeed all albuminous compounds. How large then is the demand for those constituents which even the best soils supply but in scanty proportions! We can thus understand why their direct supply in an available condition is of more vital importance to our cultivated crops than that of any other fertilizing substance.

When superphosphate of lime was first made in England, fresh or raw bones were alone employed. Then came the Suffolk coprolites, whose use was originally recommended by the late most excellent and lamented Professor Henslow; and in 1839, I had suggested the employment in a finely powdered state of the apatite, or phosphorite as manures, since these minerals are almost entirely composed of phosphate of lime.

More lately phosphate of lime in these and other forms has been pressed into the service of the manure makers, with the greatest success. Most of these have been analyzed by Professor Voëlcker, viz.:

Norwegian apatite.
Spanish phosphorite.
Cambridgeshire coprolites.
Suffolk coprolites.
American phosphate (Maracaibo guano).
Sombbrero or crust guano.
Kooria Moorria guano.
South American bone ash.
Animal black, or bone charcoal.

But the Professor did not confine himself to these phosphatic matters: he extended his very valuable researches to the composition of the recent bone, and his results are the most complete and useful that have hitherto been obtained. I cannot bring myself to abridge his report of these important inquiries. He remarks (*ibid* p. 379):

"Bones are used for agricultural purposes in the following states:

Bone-dust.
Boiled bones.
Bone shavings.

"BONE-DUST.

"Before crushing, raw or butchers' bones are now generally boiled out in an open cauldron, and by this means deprived, in a great measure, of their fat. As an article of commerce, fat is the most valuable constituent of bones. As a manuring agent it has no value whatever; or perhaps, more strictly speaking, its presence is undesirable, inasmuch as it retards the decomposition and solution of the bones. Far from being injurious, the re-

moval of fat from the bones decidedly improves their agricultural value. The following is the average composition of a number of samples of bone-dust analyzed by me:

Moisture	12'06
*Organic matter	29'12
Phosphates of lime and magnesia (bone-earth)	49'54
Carbonate of lime (determined by difference)	6'99
Alkaline salts and magnesia (chiefly common salt)	1'91
Sand	'38

100'00

*Containing nitrogen 3'69

Equal to ammonia 4'49

"In the next table is given the composition of

No. 1. Sound foreign bones.

„ 2. Decayed foreign bones.

„ 3. Decayed and sound foreign bones mixed.

„ 4. London bones.

	No. 1.	No. 2.	No. 3.	No. 4.
Moisture	12'02	12'15	12'13	12'31
*Organic matter	28'71	27'27	27'80	30'73
Phosphate of lime and magnesia (bone-earth)	49'28	52'99	52'70	49'72
Carbonate of lime	4'37	4'35	4'17	4'25
Alkaline salts	4'55	2'59	2'84	2'78
Sand	1'07	'65	'36	'21
	100'00	100'00	100'00	100'00
*Containing nitrogen	3'44	3'31	3'43	3'73
Equal to ammonia	4'17	4'02	4'16	4'52

"In decayed bones the proportion of organic matter is not quite so great as in sound bones, and the phosphates are rather higher. But the differences are not sufficiently striking to require any comment. In the preceding analyses, the lime which is left in solution after the phosphates have been removed has likewise been determined quantitatively. Calculated as carbonate of lime, it amounts in the four analyses to 8'60, 8'71, 7'50, 7'78, respectively.

"BOILED BONES.

"The bones from which glue-makers have extracted a certain portion of gelatine and nearly all the fat are known in commerce under the name of boiled bones. It must not be supposed, however, that boiled bones do not contain any organic matter, nor furnish on decomposition any ammonia. The following two analyses show the contrary:

Composition of Two Samples of Boiled Bones.

Moisture	8'06	7'70
*Organic matters	25'45	25'27
Phosphates of lime and magnesia (bone-earth)	60'48	43'73
Carbonate of lime	3'25	9'77
Alkaline salts	'43	
Sand	2'33	13'53
	100'00	100'00
*Containing nitrogen	1'84	2'78
Equal to ammonia	2'24	3'37

"BONE SHAVINGS.

"Bone shavings are produced in button-works, manufactories of knife-handles, &c., &c. Being the turnings of hard bones they contain rather more phosphate of lime and a little less organic matter or nitrogen than ordinary bone-dust.

Composition of Bone Shavings.

Moisture	13.12
*Organic matters	26.12
Phosphates of lime and magnesia.. .. .	53.74
Carbonate of lime	5.39
Alkaline salts	.78
Sand	.85

100.00

*Containing nitrogen	3.28
Equal to ammonia	3.98

"Purchasers of this valuable refuse should be on their guard, for it is frequently mixed with vegetable ivory—a substance which has no appreciable value as a manure, and which resembles so closely bone shavings that the admixture cannot be recognised by simple inspection."

The next variety of bones now extensively used in the manufacture of superphosphate of lime is, firstly, the white burnt bones, or bone-ash, of South America; and secondly, the used-up black bone-ash, or bone-charcoal, employed by the sugar-refiners. Of these the Professor observes (*ibid.*, p. 378):

"The animal charcoal, or bone-black, which is used by sugar-boilers for decolourizing crude sugar, is far too valuable a material to be used for agricultural purposes. When it has served for some considerable time as a decolourizing agent, it loses its effect, and then is revived by heating in cylinders. This revivifying process is repeated many times, until most of the carbon in the black is burned off: it is then sold to manure-manufacturers as a refuse material, under the name of animal charcoal. Like all refuse materials, its composition varies greatly. Some samples are very rich in phosphates, others poor. The amount of sand is usually very small; in some samples I have found a large proportion of carbonate of lime."

Of this bone-black, and of the South American bone-ash, the following are selected from a variety of analyses:

	Bone-black.	Bone-ash.
Moisture and organic matter	30.26	16.37
Phosphates of lime, and magnesia	60.75	64.44
Carbonate of lime, &c.	5.96	9.13
Insoluble siliceous matter..	3.03	10.06
	100.	100.

The mineral or fossil phosphates used in the manufacture in such large quantities are the coprolites of the East of England, and the native phosphates of lime of Norway, Spain, and Northern America. Of the coprolites, we have those from the Suffolk Crag and those from Cambridgeshire, being the nodules obtained in that and other localities from the Lower Chalk. The general composition of these is as follows:

Cambridge- Suffolk.
shire.

Moisture and organic matter	3.11	4.61
Phosphates.....	62.32	56.52
Carbonates, &c., &c.....	28.42	25.95
Siliceous matter.....	6.15	12.92

The apatite—a mineral phosphate—is largely imported into this country from Krageroe, in Norway. A recently-analyzed specimen was found by Dr. Voelcker to contain:

Moisture (driven off at 212 deg. F.)..	.24
Water of combination.....	.66
Lime	45.12
*Chloride of calcium	2.53
Magnesia	.74
Oxide of iron	1.29
Alumina	1.53
Potash	.36
Sulphuric acid.....	.29
†Phosphoric acid	35.69
Insoluble siliceous matter	11.62

100.07

*Containing chlorine.....	1.62
†Equal to tribasic phosphate of lime ..	77.33

The following is the composition of a specimen of the mineral phosphorite, from Spanish Estremadura:

Moisture and water of combination	.68
Lime	42.68
*Phosphoric acid.....	36.36
Oxide of iron, alumina { determined by } magnesia, & fluorine { difference }	8.81
Insoluble siliceous matter	11.47

100.00

*Equal to tribasic phosphate of lime (bone-earth).....	78.79
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Of the action of the mineral phosphates on the growth of turnips, when applied merely reduced to a powder, or previously dissolved by a mineral acid, we have not at present a very useful knowledge. Some small experiments of Dr. Daubeny, made at Oxford (*Jour. Roy. Ag. Soc.*, vol. vi., p. 329), seemed to prove that the apatite or phosphorite possesses considerable claims to the farmer's attention as a manure for roots. Some recent Irish experiments, carried on by Mr. Baldwin, at Glasnevin, in the season of 1859-60, tend to the same conclusion; so that it will be very desirable if my readers, on at least a small scale, repeat these very important experiments. In the Glasnevin trials (*Agri. Gazette*, 1861, p. 437) the farmyard manure was applied at the rate of 30 tons per statute acre—the artificial dressings at the uniform rate of three pounds per acre. The Peruvian guano cost £13 5s., the ground bones £8, the finely-ground coprolites £4 per ton. The produce of swede turnips per acre from the land thus manured was as follows:—

From Farmyard manure.....	18 tons	15 cwt.
Peruvian guano	12	10
Dissolved coprolites....	14	10
Ground bones	10	10
Dissolved bones	11	5
Ground coprolites.....	14	5

It was in 1844 that some comparative experiments on mangolds with the Spanish phosphorite were made by Sir Harry Verney, on a heavy sandy loam at Claydon, in Buckinghamshire. The mangold experiment, chiefly owing to the season, failed altogether to prove anything one way or the other; but in the succeeding year, 1845, the barley crop which succeeded the roots produced per acre as follows (*ibid*, p. 333):—

Manure.		Produce.	
Soil simple	3 qrs. 6 bush.		
Bones.....1 ton 7 cwt. ..	5	0	
Burnt bones....0 18 ..	5	3	
Phosphorite 0 18 ..	5	3	
Phosphorite & sulphuric acid } 0 18 ..	6	3	
Superphos. of lime }	1 5 $\frac{3}{4}$..	5	6 $\frac{3}{4}$

So that, upon the whole, the employment of finely-divided mineral phosphate of lime is certainly so far promising as to warrant us in repeating and extending our trials.

These enquiries are of very considerable prac-

tical value. That superphosphate of lime is almost an essential manure for our root crops hardly admits of a serious doubt, but it does need a little more experimental enquiry as to by what mode of manufacture this valuable salt is the most usefully prepared. Hitherto our great manure makers have commonly employed a mixture of bones and coprolites, and within this last year or two one great firm, the London Manure Company, have largely prepared a variety of superphosphate of lime with bones only, and this has been found to be a very powerful fertilizer; but then it admits of some question whether the supply of bones is equal to the very great demand, which would arise if their exclusive use by the superphosphate maker became general. It hence becomes a very important question—the comparative value of the superphosphate made exclusively from the mineral phosphates, and from the recent bone: and equally considerable is the enquiry how far the finely-divided mineral phosphate, without any sulphuric acid, is able to supply the place of both, for the great and invaluable root crops of our islands.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A WEEKLY COUNCIL was held on Wednesday, the 24th inst., Mr. Thomas Raymond Barker, V.P., in the chair.

The names of Candidates were proposed. It was announced that Professor Voelcker would deliver a lecture on cheese-making before the Members of the Society on Wednesday, May 8, at half-past 12 o'clock. A letter was read from the President of the Agricultural Society of Simbirsk in Russia, announcing that experiments had been instituted during the month of February for the treatment of *pestis boum* by electro-galvanism on eight head of stock, the detailed report of which, and the particulars of the treatment, would appear in the Journal of the Society of Simbirsk.

Two Reports, made to the National Association for the Advancement of Social Science, on the subject of the Improvement of the Dwellings of the Labouring Classes, were presented by Mr. Henry Roberts, and the best thanks of the meeting were awarded to the donor.

Copies of pamphlets on Arterial Drainage were also presented by Mr. Bailey Denton. The Council then adjourned.

MONTHLY COUNCIL, Wednesday, May 1.—Present: The Earl of Powis, President, in the chair; the Duke of Marlborough, the Earl of Macclesfield, Lord Berners, Lord Feversham, Lord Tredegar, Lord Walsingham, Hon. W. G. Cavendish, M.P.; Hon. Col. Hood, Hon. A. Vernon, Sir J. V. B. Johnstone, Bart., M.P.; Sir J. V. Shelley, Bart., M.P.; Sir Watkin W. Wynn, Bart., M.P.; Mr. Raymond Barker, Mr. Barnett, Mr. Bramston, M.P.; Mr. Brandreth, Mr. Buller, M.P.; Colonel Challoner, Mr. Dent, M.P.; Mr. Druce, Mr. Exall, Mr. Frere, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Holland, M.P.; Mr. Hoskyns, Mr. Howard, Mr. Hudson, Mr. Humberston, M.P.; Mr. Hutton, Mr. Jonas, Mr. Lawes, Mr. Lawrence, Mr. Milward, Mr. Pain, Mr. Pope, Professor Simonds, Mr. Robert Smith, Mr. Slaney, M.P.; Mr. Shuttleworth, Mr. H. S. Thompson, M.P.; Mr. G. Turner, Dr. Voelcker, Mr. Jonas Webb, Mr. Burch Western, and Professor Wilson. Thirty-seven new members were elected.

FINANCES.—The Hon. Col. Hood presented the

report, from which it appeared that the Secretary's receipts during the past month had been duly examined and found correct. The balance in the hands of the bankers on the 30th ult. was £3,364 15s. 7d.

JOURNAL.—The report of this committee was presented by Mr. Thompson, M.P., the Chairman. The Judges of Essays had awarded the prize of £10 to Messrs. W. and H. Raybird, of Hackwood Park, Basingstoke, for their paper on the Adulteration of Seeds. The Essays in Classes VI. and IX. for 1860 were not considered worthy of the prize.

CHEMICAL.—Mr. Wren Hoskyns, Chairman of the Committee, presented the report, which stated that Professor Voelcker would deliver a lecture on the Manufacture of Cheese, on Wednesday, the 8th May, at 12 o'clock. This lecture would form the subject of a paper in the next Number of the Journal, for which the Professor is also preparing two papers, giving the results of the experiments which he has been making on the growth of turnips. The Professor had lately received specimens of a new description of cattle food made from the refuse of the palm-nut, and stated to contain 29 per cent. of oil. It is now being made use of at the Royal Agricultural College at Cirencester, and the Professor hopes to be able to make a detailed analysis of its qualities. This report was adopted. The names of the Earl of Macclesfield and Mr. Humberston, M.P., were added to the list of the Committee.

GENERAL, LEEDS.—The report of this Committee was presented by Lord Walsingham, the Chairman, recommending that the time for entries of flax for the Leeds Meeting be extended to June 1. Arrangements have been made for procuring a supply of the best hay and forage for the use of the horses in the show-yard.

METROPOLITAN MEETING OF 1862.—A deputation consisting of the Duke of Marlborough, the Earl of Powis, Lord Walsingham, Sir John Shelley, Bart., M.P., and Mr. Brandreth Gibbs, was appointed to wait on the First Commissioner of her Majesty's Works to confer on the proposed Metropolitan Meeting.

The President brought forward his motion that it will not be expedient for the Society to hold a dinner in

London, in connection with the Show of 1862, which was agreed to.

On the motion of Mr. Thompson, M.P., seconded by the Hon. Colonel Hood, Earl Cathcart was unanimously elected a Member of the Council in the room of Lord Feversham, elected Trustee.

HOUSE LIST.—Agreeably with the bye-laws, the Council arranged by ballot an election list, to be recommended by them for adoption at the ensuing general meeting on the 22nd inst.

A Committee was appointed on the motion of Mr. Fisher Hobbs, seconded by Mr. Thompson, M.P., to re-arrange the districts of England and Wales, where the Society should hold their Country Meetings.

On the motion of Mr. Brandreth Gibbs, seconded by Mr. Milward, a Committee was appointed to consider and recommend what shall be the privileges of the Press at the Country Meetings of the Society—in reference to time of admittance to the Yard, and of being furnished with Catalogues, and with the awards of the Judges.

Mr. Holland, M.P., brought forward his motion, which was seconded by Mr. Fisher Hobbs, that the lecture lately delivered by Professor Simonds on the "Nature and Causes of the Disease known as the Rot of Sheep," should be published by the Society in the form of a pamphlet, which was agreed to, the details being referred to the Journal Committee.

At an adjourned meeting of the MONTHLY COUNCIL, on Wednesday, May 8, the Right Hon. the Earl of Powis, President, in the chair, a letter was read from the Royal Commissioners for the International Exhibition of 1862, requesting the Council to nominate two gentlemen who would be willing to act on the Central Committee formed in connection with the Class of Agricultural Machines and Implements, to advise her Majesty's Commissioners on the measures to be taken for an adequate representation of the class, to examine the demands for space sent in by intending exhibitors, to encourage the production of suitable objects for exhibition, and to settle the final distribution of space among the exhibitors in the class.

Mr. Thompson, M.P., and Mr. Brandreth Gibbs, having consented to act, the Secretary was instructed to communicate their names to her Majesty's Commissioners.

The WEEKLY MEETING OF COUNCIL was held at 12 o'clock, when the names of Candidates were proposed, and a lecture was delivered by Professor Voëlcker, Consulting Chemist to the Society, on the Manufacture of Cheese.

The Council then adjourned to Wednesday, the 15th inst., at 12, when Mr. Chadwick would read a paper on the Annals of a Liquid Manure Farm.

It is something to get a full "open" meeting of the Royal Agricultural Society. Many members of Council, active enough at other times, are only too careful to absent themselves on such occasions; while the members generally, judging from the past, come to conclude that it will be "all cut and dried," and that they need not waste a morning over such a mere matter of form. But happily this is no longer the case. There never had been so great a gathering in Hanoversquare as that on Wednesday, May 22, and as certainly there never was one so decided in its tone, or so hopeful in its character. It has been the fashion for some years past to regard the Society as exclusive in its conduct, slothful in its progress, and opposed in many ways to the due development and increasing uses of such an association. It has further been the habit to identify this stand-still policy with certain gentlemen on the management, not themselves occupying exactly the highest positions, but ever ready to take them, and so to stand answerable for a vast deal more than either their rank or abilities could in any degree justify. It would be worse than affectation to assume that these are not marked men. But more than this, the

very evident feeling of the Meeting went far to confirm all that has been rumoured. The Society has not been doing what it should and might have done, while the obstructives themselves were as easily identified as if we were here to give each one by name. Mr. Sidney was no longer accuser-general. Of course he made his "usual speech"; but only to be followed by men of all grades, who had each one some standing abuse to complain of, or some out-projected improvement to insist upon. Let the reader look to the very full report of the proceedings which we give, and gather from this how much longer it will be reasonable or even possible to resist the rush of general opinion so forcibly expressed. The Members of the Royal Agricultural Society are coming to take an active interest in the Institution, and it will be well to see to what they require, ere it be too late for such as resist them.

If most of the speakers had pet projects of their own, greater publicity was the common cry. If one man reads a useful paper, or another makes some sensible remarks upon it, let us have them at once circulated. There is neither use nor sense in keeping everything back for the *Journal*; for, as a rule, people will read the newspapers, but they will not read the *Journal*. So said Mr. Moore from Wiltshire, so said Mr. Baker from Australia, Mr. Orlebar, and others; while *Hear, hear*, and general cheers testified as to how the meeting went with them. The lecture of Professor Simonds on the Sheep Rot has done some good already, but not through the immediate agency of the Society. Even after more than a month's grace from the time of its delivery and appearance in our columns the Essay was not ready to be laid upon the table. In the interim the Bath and West of England *Journal* is out, with a treatise on sheep rot of its own, while the Royal is waiting for a few woodcuts that will be ready "shortly"—but an indefinite promise when we remember whence it comes. In the face of this example, Mr. Thompson, has openly announced, as Chairman of the Journal Committee, that the publication of Professor Simonds' paper must not be taken as a precedent. Unfortunately Mr. Thompson was not present at the General Meeting, but in his absence Mr. Wren Hoskyns undertook the defence; and he began by saying that he thought it would be unadvisable to admit reporters to the Monthly Council of Management. This, however, being a point that no one had ever dreamed of pressing, or even moving, and Mr. Hoskyns' attention being recalled to the business of the weekly meetings, he ended by saying that he imagined the reporters were admitted to their weekly meetings already. His own opinion being, as it would appear, that they should be there. However the chairman is against any such an innovation, and the *Journal* thus promises to become as great a bugbear as the very *Charter* itself. You can't do this because of the *Journal*, and you must not do that on account of the *Charter*, until one feels tempted to follow Old Noll's example, and to march in with a file of common members at his side, and an angry order to "take away that bauble!"

But many of the Council are clearly coming to work with the outside majority. Lord Feversham thought there was much worthy of consideration in what Mr. Sidney said, while his Lordship made an effective onslaught on our old enemy, the over-fed prize bull. Others, again, like Mr. Hobbs, Mr. Torr, and Mr. Wallis—the practical mind of the Council—are ready to advance; and it will be vain for Mr. Thompson, with his *Journal*, and Colonel Challoner, with his *Charter*, to resist them. As was well said, how is it that the arrears have been collected so closely, and that this part of the Balance-sheet reads

so well? Simply by bodily turning out an incompetent Finance Committee, and putting better men in their stead. What will increase not merely the finances, but the numbers, the influence, the means, and the way to do good, but by putting the power into proper hands? Let every incapable or obstructive remember that from this time forth at every General Meeting of the Society he will be put upon his trial; and that, curb or smother publicity as he may, his acts will "out."

We can honestly congratulate the Royal Agricultural Society on that countenance which, as we announced last week, it will now enjoy. We can, further, congratulate the best friends of the Association on the sensible, independent, and straightforward tone of the Meeting on Wednesday. It was an occasion eminently suggestive of advancement; but the query is, what will become of such suggestions? When Lord Feversham tells us that we are destroying our best breeds of stock by overfeeding the animals exhibited at the Society's Show, we ask, will the Council look to this? When Mr. Beale Brown demonstrates that the present plan of shearing a show sheep is little less than an organized robbery, we turn to the Council to think over the remedy. Other such Societies have found it. When Mr. Baker from Australia, Mr. Moore from Wiltshire, Mr. Orlebar from Bedfordshire, and Mr. Sidney from London—when a colonist, a farmer, and a country gentleman, assure us not only what good the Society would do, but what good would follow to the Society, by the immediate publication of useful papers, and by encouraging the delivery of such addresses, we pause to think over what may come of such recommendations—many of them made in answer to the customary invitation from the President himself.

According, then, to all previous precedent and rule as heretofore observed, the next number of the *Journal* will contain the report of the Council as read at the General Meeting in May, and—nothing more! There will not be one word or line of the comments made on the framers of this Report, or the able advice offered for their future course. If absent members confine their reading to the pages of the *Journal*, they will really know little or nothing of the Society's proceedings, or what their brother-members are anxious to be doing. To be properly up even in the business of their own institution, they will have to turn to those dreadful people the reporters, and their equally terrible instruments, the newspapers.

The General Meeting of this Society was held on Wednesday, May 22, in Hanover-square. The chair was taken at noon by the Earl of Powis, the president for the year. The attendance, which was very much larger than usual, included Lords Feversham, Walsingham, Berners, and Heytesbury; the Honourables Colonel Hood, John Carnegie, and Leslie Melville; Messrs. E. Holland, M.P., C. Wren Hoskyns, W. Fisher Hobbs, W. Torr, R. Milward, Challoner, Owen Wallis, T. B. Western, W. Ridden, Jonas Webb, C. S. Cantrell, H. B. Caldwell, J. Shuttleworth, J. Howard, C. E. Amos, Professor Simonds, J. Druce, S. Druce, R. Neville Grenville, Beale Brown, M'Cintock, E. Wells, Orlebar, W. Woodward, E. W. Moore, W. Astbury, H. Corbet, W. Dickenson, W. S. Turner, S. Sidney, Magendie, Professor Solly, H. Stratford, Smith, J. Hercy, J. Baker, J. Hutchenson, W. Yates Freebody, Stanforth, Saunders, Simpson, Pritchard, M'Intosh, Roddrom, Collingwood, Deysey, P. Severn, Pickin, and Smyth, with Mr. Frere the Editor, and Mr. Hall Dare the Secretary.

The first business was the election and re-election of members of the Council going out by rotation. The result of the scrutiny was that the following list as submitted by the Council was unanimously adopted:—Thos. D. Acland, Sprydoncote, Exeter; Charles Barnett, Stratton Park, Biggleswade; Humphrey Brandreth, Houghton House, Dunstable; James Wentworth Buller, M.P., Downes, Crediton; Charles Cantrell (new Member of Council), Riding Court Farm, Datchet; Earl

Cathcart (elected May, 1861), Woodend, Thirsk; John D. Dent, M.P. (new Member of Council), Ribston Hall, Wetherby; Anthony Hamond, Westacre Hall, Brandon, Norfolk; Colonel the Hon. Alex. Nelson Hood, Cumberland Lodge, Windsor; John Hudson, Castleacre Lodge, Swaffham; Philip Stapylton Humberston, M.P., Mollington, Cheshire; Richard Milward, Thurgarton Priory, Southwell; Thomas Pain, Laverstock Hall, Salisbury; Edward Pope, Great Toller, Maiden Newton; Earl of Powis, Powis Castle, Welshpool; William Ridden (new Member of Council), Hove, Brighton; James Banks Stanhope, M.P., Revesby Abbey, Horncastle; William Torr, Aylesby, Great Grimsby; George Turner, Barton, Exeter; Hon. Augustus Vernon, Sudbury, Derby; Owen Wallis (elected November, 1860), Overstone Grange, Northampton; Thomas Burch Western, Felix Hall, Kelvedon; Henry Wilson, Stowlangtoft Hall, Bury St. Edmunds; Professor John Wilson, Iver, Uxbridge; Sir Watkin Williams Wynn, Bart., M.P., Rhuabon, Denbighshire.

Lord FEVERSHAM said he rose to propose a motion which he was sure would meet with cordial approval. Some time ago it was suggested that his Royal Highness the Prince Consort would probably undertake the presidency of the Society during the year in which its meeting was held in the metropolis. A deputation waited upon his Royal Highness, not long since, to ascertain his views on the subject; and they had the satisfaction of finding that he was willing to accept the office (cheers). A communication to this effect was received at the ensuing meeting of the Council with the greatest satisfaction, as the intelligence it conveyed would be by the agricultural community at large; and he had no doubt that that meeting would unanimously concur in the feeling of the Council on that subject. Without further preface, he begged to move, "That his Royal Highness the Prince Consort be solicited to honour the Society by accepting the office of President for the ensuing year, and that a deputation be appointed to convey to his Royal Highness the request of the Society."

Mr. FISHER HOBBS, in seconding the resolution, said, as one of the farmers of this country, he felt that he expressed their sentiments as well as his own when he expressed his satisfaction at the prospect of his Royal Highness becoming the president of the Society for the ensuing year (cheers). This pleasure was derived not merely from the high rank of his Royal Highness, or from the fact that he was the consort of their beloved Queen, but also from the fact that he had shown himself, to a certain extent, a practical farmer. His Royal Highness had always encouraged and supported that Society, not only by his presence, but also by his exhibition of animals at its country meetings; and having had the honour of visiting the royal farms for several years, he (Mr. Hobbs) could testify that no landlord in this country was carrying out agricultural improvement to a greater extent, or manifesting a greater desire for its development, than the Prince Consort (cheers). Evidences of this disposition were afforded, not merely by the erection of farm-buildings, but also by the keeping of good breeds of stock, by drainage operations, by good cultivation, and by everything which conducted to the success of modern farming. He was sure there would be a unanimous feeling of satisfaction in that Society, and among agriculturists throughout the country, if his Royal Highness would do them the honour of accepting the presidency (cheers).

The resolution having been put, and carried unanimously, On the motion of the Chairman, seconded by Colonel Challoner, it was resolved that the deputation should consist of the President and Secretary of the Society, together with the mover and seconder of the resolution.

The trustees having been re-elected, the Chairman was about to put the names of the proposed vice-presidents, when

Mr. S. SIDNEY requested that they might be submitted seriatim, as he had an amendment to propose, and this was accordingly done.

Lord Walsingham having been re-elected vice-president without opposition, on the next name in order being submitted, namely, Mr. Raymond Barker,

Mr. S. SIDNEY proposed, as an amendment, the name of his Grace the Duke of Sutherland, and Mr. Freebody seconded the motion.

The CHAIRMAN (after consulting with the Secretary, who retired from the room to obtain a copy of the rules of the Society) observed that the present Duke of Sutherland being

a life member, and not a governor, he was not eligible for the office of vice-president (laughter).

Mr. Raymond Barker and the remaining vice-presidents who retired by rotation were consequently then re-elected.

The CHAIRMAN said, before calling upon the secretary to read the report, he must congratulate the meeting on the prospect of the Society being presided over by His Royal Highness the Prince Consort, on the very interesting and important occasion of the holding of their country meeting, to use what was somewhat of an Irishism, in London (laughter). Some years ago, when the first Great Exhibition was held in the metropolis, the Society was graciously permitted by Her Majesty to hold its meeting in the Home Park, at Windsor. Next year an exhibition was to take place in London, which would no doubt attract persons from all parts of Europe; and as in that year the Society's meeting was to be held there, he thought they were taking the course which was most consonant to the interests of the Society in requesting the Prince Consort to accept the office of President; and he was sure that every member of the Society, who had observed what a lengthened and continuous interest the Prince Consort had taken in the annual shows, how he had attended them on several occasions himself, and how largely he had contributed to the exhibitions of animals, would agree with him that they were very fortunate in being thus enabled to show His Royal Highness the sense they entertained of the services which he had rendered to that Society (cheers). Her Majesty had been pleased to consent to the Show next year being held in Regent's Park; and the Council had just concluded the requisite arrangement of terms with the Chief Commissioners of Woods and Forests. That park would afford an extremely eligible site. The space of 26 acres, which the Society would be permitted to occupy, would afford ample room for the show, and also for the great multitudes of people who would probably attend; for in a place like London it was as necessary that there should be large alleys, or facilities of circulation for the spectators, as that there should be ample space to show the animals and implements to the greatest advantage. The report would mention the vacancies which had taken place among the Trustees and Vice-Presidents, and which had been filled up in the ordinary course by the Council. One of the vacancies was caused by the decease of the late Duke of Sutherland, who was one of the very earliest members of the Society, and who took a great and enlightened interest in the condition of the large estates which both in England and Scotland he inherited. The Council had been able to make a further investment of £2,000 in the Three per Cents., through the diligence and success of the Finance Committee in collecting a considerable quantity of long outstanding arrears. He would here remark that gentlemen who took an interest in the financial prosperity of the Society, could hardly assist it in any way more materially than by asking their friends, who had become members, to give their bankers an order to pay their subscriptions annually as they became due. It often happened, where an order of that kind had not been given, that the annual subscription was not paid at the proper time, and it was generally disagreeable to pay a considerable amount of arrears which had accumulated with the lapse of years (Hear, hear). The Council trusted that the meeting at Leeds would be a large and successful one. They had, in accordance with the report of the Committee appointed to inquire into this subject, determined that members should be admitted by tickets gratis to the Show-yard (cheers). This was a change which it had often been stated would be very agreeable to the members generally. The Committee thought that, with proper precautions, the wish expressed might be safely gratified, and he trusted that it would not only lead to the accession of a considerable number of members from among those who were in the habit of attending the country meetings, but also tend greatly to the personal convenience of members by enabling them to go in and out of the show-yard as often as they wished during the day, instead of being obliged to stay there the whole time after they had once entered, or, if they went away, to make a fresh payment on their return. The country shows had now made about a third circuit of England, and as next year they were to meet in the metropolis, the Council thought that afforded a good opportunity of revising the districts into which the country was divided for the country meetings, these not having been exactly the same in the first and second tours. They found that the

first tour was a very good one, and considered it desirable that it should be retained. The country now stood divided into nine rural districts, with a tenth district comprising the metropolis and its neighbourhood: probably a decennial interval would always be sufficiently remote from the preceding metropolitan meeting to ensure a continued attraction of the very large population of the metropolitan district. In conclusion, he begged to state that the valuable lecture "On the Rot in Sheep," which was delivered a short time ago by Professor Simonds, was in process of printing under the direction of the Printing Committee; and he hoped that in a short time it would be issued, and that it would prove useful in all parts of the country during the present summer.

The SECRETARY (Mr. H. Hall Dare) then read the following report of the Council:

REPORT.

The Council have to report to the members at their present general meeting that during the past half-year 87 members have been elected into the Society, 6 governors and 67 members have died, and the names of 236 members have been on various accounts omitted from the list of the Society, which accordingly now comprises:

84 Life Governors,
90 Governors,
3,328 Members,
1,113 Life Members, and
18 Honorary Members,

Making a total of 4,633 names on the list.

The Council have elected Lord Feversham to supply the vacancy in the class of trustees, and Lord Walsingham in that of the vice-presidents, caused by the decease of His Grace the Duke of Sutherland, and the resignation of the Earl of Hardwicke.

Mr. William Sanday, of Holme Pierrepont, has been elected a member of the Council in the room of Lord Walsingham, and the Earl Cathcart in the room of Lord Feversham.

The statement of accounts for the half-year ending 31st December, 1860, has been examined and approved by the Society's auditors, and by Messrs. Quilter, Ball, and Co.

The funded capital has been lately raised to the amount of £14,219 2s. 9d. stock in the New Three per Cents. by a further investment of £2,000.

The Finance Committee have been enabled to effect this by the large collection of arrears of subscription, which they have received authority from the Council to require all defaulters to pay. Repeated applications having been made for the arrears still outstanding, it has been decided to take proceedings in the County Courts against those who continue indebted to the Society.

It has been resolved that on the proposal of any person as a member, a form shall be sent by the Secretary to the candidate for his signature, containing an acknowledgment of his future liability, which letter he must return before his election can be proceeded with.

A letter will also be sent to each member in the course of the year, reminding him of his subscription being due.

The bye-laws and resolutions of Council having been collected and revised, a reprint of them has been made, and a copy will be forwarded to any member on application to the Secretary.

The question of the free admission of governors and members to the show-yard during the Society's country meetings has been under the consideration of the Council.

Governors and members who have paid their subscription for the current year, will be admitted free by tickets issued by the Secretary, which tickets will not be transferable; and any governor or member who shall be found to transfer or lend his ticket will be reported to the Council, and will in future forfeit the privileges of membership. Application for the member's ticket is to be made in London, either by post or personally, not later than Friday, the 12th of July, and afterwards at the Secretary's office, near the entrance to the Show-yard.

During the last month Professor Simonds has delivered a lecture on the Nature and Causes of the disease known as the Rot of Sheep; and Professor Voelcker, on the Manufacture of Cheese.

It has been determined to print Professor Simonds' lecture as a separate pamphlet.

The interest attaching to the country meeting will be this year largely increased by the competitive trials of steam-cultivators. The result of these trials will be made known at the Leeds meeting.

The Society having offered this year a prize of £100 for the best thorough-bred stallion, having served mares during the season 1861, which, in the opinion of the Judges, is best calculated to *improve and perpetuate* the breed of the sound and stout thorough-bred horse for general stud purposes, and an unusually large amount for horses in other classes, they contemplate that great interest will be evinced at this meeting by the breeders of horses and the public generally throughout the Kingdom.

The entries of implements and machinery in motion, to be exhibited at Leeds, closed on the 1st of May, and the Council have the satisfaction of stating that the applications for space in this department of the Show-yard exceed those of any previous meeting of the Society.

The entries for live stock and flax, which will close on the 1st of June, already give indications that this portion of the exhibition will be equally satisfactory.

The arrangements for the Leeds Meeting, to be held in the week commencing Monday 15th of July, are advancing rapidly. The Show-yard will be open as under:—

Monday, for implements, and for stock	s. d.
(after the judges have made their award)	5 0
Tuesday	2 6
Wednesday	2 6
Thursday	1 0
Friday	1 0

The successful competitors for the prizes offered by the Society have been, in class IX, for 1859, Professor Tanner, of Queen's College, Birmingham, who gained the prize of £10 for his Essay on the Breeding of Farm Stock, and in Class VIII., for 1860, Messrs. Raybird, of Hackwood Park, Basingstoke, the prize of £10 for their paper on Adulteration of Seeds.

In Classes VIII., for 1859, and VI. and IX., for 1860, the Essays were not considered worthy of the prizes, and the Council cannot forbear from expressing their regret that there was not greater competition.

Her Majesty has been graciously pleased to grant a site of 26 acres in the Regent's Park for the purpose of holding an Exhibition of Stock and Implements in 1862. The Council have made the necessary arrangements with the Office of Works, and trust that the number of distinguished agriculturists, British and Foreign, who will visit the International Exhibition will by their presence in the Show-yard have an opportunity of witnessing the magnitude and success of our department of National Industry.

It has been resolved by the Council to maintain the original scheme of Districts for the Country Meetings of the Society, viz.:—

- A. Comprising the counties of Cumberland, Durham, Northumberland, and Westmoreland.
- B. Lancashire and Yorkshire.
- C. Cheshire, Shropshire, and Staffordshire.
- D. Derbyshire, Leicestershire, Lincolnshire, Nottinghamshire, and Rutlandshire.
- E. South Wales and Herefordshire, Monmouthshire, and Worcestershire.
- F. Bedfordshire, Berkshire, Buckinghamshire, Gloucestershire, Northamptonshire, Oxfordshire, Warwickshire, and Wiltshire.
- G. Cambridgeshire, Essex, Hertfordshire, Huntingdonshire, Norfolk, and Suffolk.
- H. Cornwall, Devonshire, Dorsetshire, and Somersetshire.
- I. Hampshire, Kent, Surrey, Sussex.
- K. The Metropolis and its Postal District.

By Order of the Council,

H. HALL DARE, Secretary,

Lord BERNERS in moving the adoption of the report said, he would confine himself to a congratulation of the members on two announcements made in it; first, that the members of the society were, in future, to be admitted to the shows without any payment; and secondly, that the public were to be admitted to the Stock Show on Monday without being subjected to any additional charge.

Mr. S. SIDNEY said, he rose to second the resolution chiefly because it would afford him the opportunity which he desired of making some observations. He would confine himself to a

very few points, but they were points of considerable importance. It was impossible for him and those who agreed with him to object to anything that was in the report; what they did object to was the omissions in the report. One of the most satisfactory features of the report was the state of the finances. It appeared that the society had now nearly 5,000 members, and something like £14,000 in the funds. £2,000 had been added to the society's property in the funds lately. But how did the society get that £2,000? Why, the satisfactory state of the finances was obtained, as other improvements must be, by a sort of revolution, to the causes of which he would not allude, but of which he would say that it resulted in the placing on the Finance Committee of an entirely new set of gentlemen, who, not being bound down by any traditions, went vigorously to work to carry out the object of the society. He repeated that it was to similar changes that they must look for further improvements in the society. So long as year after year the same gentlemen were members of the Council, some of them being gentlemen of very advanced age indeed, gentlemen who were, no doubt, very energetic in their younger days, but who had now experienced the natural effects of time; so long, he said, as that was the case, they must either not look for improvement, or expect to find all attempts at improvement resisted to the last. This led him to a point on which there had been very great and general complaint; he alluded to the tardiness with which the members as a body received any account of those proceedings of the society which were surrounded with the greatest amount of interest. He would give one striking instance. The other day, when the whole agricultural community was in a state of great anxiety with regard to the rot in sheep, Professor Simonds gave in that building to a small party of twenty or thirty gentlemen a lecture of the greatest importance on that subject. It was only, as it were, by an exception, by a departure from the ordinary rule of the Council, that that lecture found its way into the public prints; and he should be borne out by other gentlemen present when he said that it was with the greatest difficulty that they were able to obtain a resolution authorising the immediate publication of that lecture. In the first instance the Chairman of the Meeting paid no attention to the wish of those who proposed that it should be published at once; but through the firmness of one of the members of the Council, who placed the matter in writing, a resolution was passed to the effect that that important lecture should be published. But there were means of obstructing what could not be refused. The resolution was, as he had intimated, carried; but up to that day the lecture had not been published by the Society, and to all appearances the anxieties of sheep-farmers would be resolved either by the loss of their sheep or by their recovery before that lecture had found its way to the light. But extraordinary as was that delay, there was the same tardiness in the publication of the reports. He could not say for what reason there was that tardiness, but he was quite sure it did not arise from a wish to do harm to the society. Perhaps the principal reason was the prejudice which some gentlemen entertained against publication, to which he might add a want of businesslike habits on the part of those who had the management of the printing department. In this view he was borne out by the fact that on a very recent occasion on which a lecture was delivered, Mr. Thompson, the Chairman of the Journal Committee, entered a protest against the publication of Professor Simonds's lecture being drawn into a precedent, that gentleman being desirous of retaining the lectures for insertion in the *Journal*. If Mr. Thompson's principle were right, the committee might cease to give themselves the trouble of having the lectures reported at all; for if they were only to be printed in the *Journal* of the Society, it was only a very small circle of agriculturists who would read them. But he submitted that it was not consistent with the intention of the founders of that Society that valuable papers should be cuddled up on shelves in the printing department of that establishment, instead of being diffused to the world. (Cheers.) That society was established and supported in order that it might promote agricultural progress and improvement; and he was sure that the more it promoted that, the more it would flourish, and that the extensive publication of valuable papers emanating from it would prove infinitely more advantageous than any benefit which was likely to be derived from the sale of the *Journal*. The *Journal* would always be valuable as a permanent record, and its circulation would not be in the slightest degree dimi-

nished by the previous publication of the lectures in newspapers (Hear, hear). He thought he had now said enough with regard to the lectures. There was another question bearing on the same point—he had referred to it before, but he must continue to do so until it had been fully and effectually discussed; he alluded to the Wednesday meetings. On Wednesday during the season the members of that society were at liberty to come there, listen to any paper which might be read, and take part in the subsequent discussion. But by an extraordinary rule—a rule which was not adopted, he believed, by any other society which had not a reporter of its own—reporters for the press were excluded. He knew that some societies which had discussions on important subjects employed their own reporter, and if that society were to do so the expense would probably not exceed £150 a-year. This rule of exclusion was utterly indefensible. Either the papers read were important, or they were not important. If they were important the sooner they were given to the agricultural public the better; if they were not important, why should they be read there at all? He wished to know why that society did not in this respect follow the example of many of the learned societies—for example, the Society of Arts, the Geographical Society, and the Ethnological Society, whose discussions were reported. The other day Mr. Chadwick read a paper there to about 15 persons: that gentleman being a *littérateur*, his paper soon appeared in print, and was read everywhere; but the valuable observations made on the occasion by Mr. Dickenson and Lord Essex were entirely lost. It often happened that gentlemen who were not disposed to prepare a paper made very valuable remarks in the course of discussion (Hear, hear). The proceedings of the Farmers' Club afforded frequent proofs that such was the case; but there the remarks made in discussion went forth to the public, while in the case of this society any remarks which were elicited by the reading of a paper were practically lost to agriculturists (Hear, hear). In fact, that society was in what he might justly describe as a torpid state; it was doing exactly the same things that it did 20 years ago, and was going through exactly the same routine, whereas there was no reason why, with its increased influence and command of money, it should not do a great deal more (Cheers). Why did it always continue the same routine? Because it had always the same gentlemen at the head of affairs (Hear, hear). In looking over the list of the Council which had just been adopted, he observed that the name of an eminent implement maker who was on the Council last year had been omitted. Well, he had no objection to the principle of omitting an old name in order that there might be an infusion of new blood into the Council; but, then, what was sauce for the goose was sauce for the gander (laughter); and he thought that if they looked over the list which had been presented, they might find the names of some other gentlemen who might be relegated to other duties without injury to the society (renewed laughter). He had himself proposed the Duke of Sutherland in the place of Mr. Barker, not in the hope that his amendment would be carried, but simply with the view of establishing, as it were, the principle that there might be a change in the list submitted (Hear, hear). Those who had read the interesting memoirs of Sir Robert Peel knew that when that statesman, on one occasion, reconstructed his ministry, Lord Eldon was very much annoyed at being left out. Lord Eldon was doubtless a very able and a very amiable man; but his colleagues thought that however able he might have proved himself in past times, the period had arrived when it was desirable that he should retire from active life, and give place to others who were younger and more energetic (Hear, hear). The same principle was applicable to the management of the affairs of that society. The most satisfactory thing, to his mind, which he had heard on that occasion, was that the president for the ensuing year was to be his Royal Highness the Prince Consort (cheers). He would tell them why he considered it so satisfactory. It was not only in consequence of his Royal Highness being a practical farmer, though that was of course a great point, nor in consequence of his distinguished rank; it was also because his Royal Highness had never taken an interest in any art or science without having shown himself to be in favour of progress (cheers). He did entertain a very confident expectation that when his Royal Highness took the chair he would not be satisfied with doing what the noble earl who occupied the chair that morning did, and with great

ability and courtesy, at the last meeting; that was, with defending the society for doing nothing (loud laughter). He (Mr. Sidney) must confess he never heard a more able defence than that (renewed laughter); but, nevertheless, he trusted that, as his Royal Highness the Prince Consort had identified his name with progress in other departments, so he would also identify it with progress in connection with the Royal Agricultural Society (Cheers).

The motion was then put and carried.

The CHAIRMAN said the next duty he had to perform was that of announcing the place for the General Meeting of the Society in 1862. Under the Charter they were bound to hold three meetings in the year, two in London and one in the country. Next year the annual exhibition being held in London, it would be necessary to dissociate that from the country meeting, and in conformity with the terms of the Charter to hold a general meeting somewhere in the country. The Council thought that Windsor would be the best place in the country for holding that meeting, which would not be a meeting for exhibition, but simply one for the transaction of any business that might be brought before it. Windsor had therefore been selected as the place for the General Meeting of the Society in the country in the year 1862.

Col. Hood, the Chairman of the Finance Committee, presented the following balance-sheet:—

ROYAL AGRICULTURAL SOCIETY OF ENGLAND. HALF-YEARLY CASH ACCOUNT FROM JULY 1 TO DEC. 31, 1860.				
Dr.				
To Balance in hand, 1st July, 1860 :—	£	s.	d.	£ s. d.
Bankers				3,647 6 10
Secretary				12 15 0
To Income, viz.:—				3,660 1 10
Dividend on stock	£	s.	d.	172 10 0
Subscriptions:—	£	s.	d.	
Governors' life-com- position	50	0	0	
Governors' annual	35	0	0	
Members' life-com- positions	139	0	0	
Members' annual	2,112	1	0	
				2,336 1 0
Journal:—Sales..	141	11	2	
Advertisements	47	13	3	
				189 4 5
				3,367 1 9
Country meeting :—Canterbury				6,064 17 2
				£9,724 19 0
Cr.				
By Expenditure :—	£	s.	d.	£ s. d.
Official salaries and wages (3 quarters)	491	9	0	
Establishment—House expenses, rent, taxes, insurance .. }	338	15	3	
				828 4 3
Postage and carriage				26 12 8
Journal:—				
Printing	471	17	0	
Editor's salary (3 quarters)	375	0	0	
Prize essays	120	0	0	
Other contributors	72	3	0	
Delivery and adver- tising	123	15	5	
				1,162 15 5
Consulting chemist's salary				150 0 0
Advertisements				3 12 6
Testimonial to B. T. Brandreth				
Gibbs, Esq., Balance				25 4 0
Sundries				10 2 4
Subscriptions returned				3 0 0
				2,209 11 2
By Country meetings:—				
Paid on account—				
Canterbury expenses				4,215 15 3
Leeds				1 0 1
				4,216 15 4
Prizes at Canterbury—				
Stock				1,627 0 0
Implements				293 0 0
				1,920 0 0
By Purchase of Dynamometer				100 0 0
By Balance in hand:—				
Bankers				1,236 19 2
Secretary				41 13 4
				1,278 12 6
				£9,724 19 0

(Signed)

(Signed) A. N. HOOD, Chairman of Finance Committee.
T. W. BRAMSTON.
WILLIAM FISHER HOBBS.
QUILTER, BALL, JAY, & Co., Accountants.

Examined, audited, and found correct, this 17th day of
May, 1861. (Signed) WILLIAM ASTBURY.
HENRY CORBET.
WILLIAM COHEN.

BALANCE SHEET, 31st DECEMBER, 1860.

LIABILITIES.			
To Capital:—	£	s.	d.
Surplus, June 30, 1860	16,660	13	7
Less surplus of expenditure over income during the half-year, viz:—			
Expenditure....£4,314 10 10			
Income.....2,697 15 5			
	1,616	15	5
	15,043	18	2
To Canterbury Meeting:—			
Account outstanding.....	32	11	0
	£15,076	9	2
ASSETS.			
	£	s.	d.
By cash in hand.....	1,278	12	6
By New Three per Cent. Stock £12,000, cost	11,796	14	7
By books and furniture, Society's house, Han- over-square	2,000	0	0
By Leeds meeting	1	2	1
	£15,076	9	2

[Mem.—The above assets are exclusive of the amount recover-
able in respect of subscriptions in arrear on the 31st of Decem-
ber, 1860, which at that date amounted to £1,261.]

The CHAIRMAN having proposed the adoption of this
statement,

Mr. NEVILLE GRENVILLE said he wished before that
motion was put to congratulate the meeting on the very large
sum which the Society had in the Funds, and to express a
hope that the Council would devise some means of spending
a portion of it advantageously. (Hear, hear). He was quite
sure that that Society need not feel itself called upon to leave
a large amount of money to posterity; and he should be very
glad to see some of the money invested spent in the advance-
ment of the art with which they were all associated. (Hear,
hear). With great deference he would direct the attention of
the Finance Committee to one item of expenditure. The
prize of which they had just heard, of £100 for a stallion,
showed that the inferior show of horses at Canterbury had
produced its due effect on the Council, and that they wished
to improve the breed of horses to the greatest extent in their
power by offering a handsome premium for the best male
animal. He wished, however, to observe that he had heard it
stated that one reason why the show of horses at Canterbury
was not such as it ought to have been was, that the accommo-
dation for them was so inferior that the owners of the
most valuable animals would not send them. He would sug-
gest that some portion of the large fund which was accumu-
lated should be applied in providing better accommodation
for valuable horses (Hear, hear).

Mr. FREEDY complained that the prizes or rewards
given by the Council for essays on agriculture were not suffi-
ciently liberal, and thought that some portion of the £2,000
recently invested should be applied in increasing them. Fif-
teen or sixteen years ago, he himself forwarded to the Council
an essay on which he had bestowed great labour, upon the re-
clamation of land from the sea on the Lincolnshire coast; but,
to his great surprise, it was returned to him, without any re-
ward for his labour. Mental as well as physical exertion re-
quired some reward; and he thought the purse-strings of the
Society should be opened more liberally than they had been
for works pertaining to the advancement of agriculture.

Mr. FISHER HOBBS trusted that he should not be out of
order, if he endeavoured to set Mr. Grenville right in regard
to the financial position of the Society. That gentleman ap-
peared to imagine that the finances were in a very flourishing
state. He (Mr. Hobbs) wished to observe, in order that there
might not be any misapprehension on the part of the public,
that the fund mentioned did not represent the surplus income
of the Society (Hear). Under the rules, the Council were
obliged to keep a certain amount invested, to represent the in-
terest of life-governors and life-members. There were 84 life-
governors who had paid £50 each, and 1,113 who had paid

£13 each; and by one of the bye-laws it was declared that
the compositions for life-membership or life-governorship
should not be applicable to defray the current expenses of the
Society. The £14,000, therefore, which was invested did not
really belong to the Society, in the sense of being applicable
for current expenses, but was intended to be kept in hand, to
represent the interest of the life-governors and life-members.
They had a balance of £14,219 2s. 9d.; but he believed that,
according to strict calculation, the amount ought to be
£15,330. Therefore, instead of admitting that that was a
wealthy society, which had funds at command, to spend as it
pleased, he must call upon those present to aid the Council in
carrying out the object in view, by an increase in the number
of members; and he trusted that one result of the Prince
Consort's being the President next year would be that, instead
of 4,600 members, they would soon have 10,000 (cheers). The
Society had done a great deal of good already; but, as a work-
ing member of the Council, he would declare that, if they
could double their subscriptions, they would treble, and more
than treble, their usefulness (cheers).

Mr. ORLEBAR said, having attended many of the meetings
of the Society, and having frequently heard both farmers and
landowners express their opinions with regard to it, he must
say that there appeared to be a general impression that, con-
sidering the number of members and the amount of funds, the
Society was not doing as much good as it ought to do (Hear,
hear). Seeing that the meeting next year was to be held
in London under circumstances which would probably lead
agriculturists from all parts of the world to flock to England,
he trusted that the Council would consider well whether
the present was not a proper time for effecting some improve-
ments. To him, he must say, it appeared very strange that
reporters should still be excluded from the weekly meetings
of the Society. Why were they excluded? The reason given
by Mr. Sidney was, that the papers read would otherwise
be published a little sooner than they appeared in the Society's
Journal. There would, he thought, be little harm in that, and
a great deal of good. People would take much greater in-
terest in the Society's proceedings if reporters were allowed
to attend. The members were very much obliged to the
Council for what they had done; but many of them thought
that a great improvement might be effected by an alteration
in some of the rules and bye laws.

Mr. S. SIDNEY said he should not have intruded himself
on the meeting a second time but for the observations of Mr.
Fisher Hobbs with regard to the fund invested. That gentle-
man said that, under the bye-laws, the Council were bound to
maintain that fund intact, on account of the interest of the
life-governors and life-members. No doubt it had been dis-
covered by many that the composition for life-membership
was a cheap arrangement for the person who effected it (Hear,
hear). What the Council had to do in this matter was, he
conceived, to take care that the Journal of the Society was
delivered to life-members; that was all such persons could
fairly require. What was the precise value of the Journal he
would not pretend to say. He knew it could be bought very
cheap secondhand—(laughter)—like a great many other use-
ful books (Hear, hear); but he would suggest that the Coun-
cil should take into their serious consideration whether it
were not desirable that the bye-law to which Mr. Hobbs
alluded should be altered. Somehow or other life composi-
tions had of late years increased and ordinary subscriptions
diminished. He could really see no reason why the fund in-
vested should not be reduced one-half, provided half of it
could be expended usefully for the Society (Hear, hear). The
origin of the bye-law probably was, that Lord Spencer feared
that without such a regulation the Society might break down
(Hear, hear). There was no danger of that at present (Hear,
hear); the Society was firmly established, and it was not
likely to go down if the Council performed their duty.

Mr. MOORE (Wilt.) maintained that papers read should
go to the public journals at once; and instanced the case of
Professor Simonds' lecture, the early appearance of which had
led to much profitable talk at the market dinners and other
meetings in his own county.

Mr. BAKER, from Australia, said he had been for some
years a life-member of that society, and he happened also to
be the president of the South Australian Agricultural Society.
In the latter capacity he had often deeply regretted that the
proceedings of that society were not more extensively pub-

lished (Cheers.) Agricultural information of every kind was eagerly sought for by the farmers of South Australia; and as the price of that society's Journal placed beyond the reach of a large class of farmers the important information which it contained, he did trust that the Council would take into serious consideration the remarks which had been made on that subject, and either by the admission of reporters, or by the speedy publication, in some cheap form, of all papers and documents which were read before the society, provide that such things should find their way to all parts of the world, producing beneficial results not only here, but in the colonies of the British empire (cheers.) He perceived that the sale of the Journal amounted to only £140.

Mr. HOBBS: That is the sale of half a year.

Mr. BAKER: Well, even a sale of £280, or of a much larger amount, would not, in his opinion, be a sufficient reason for excluding reporters (Hear, hear.) He trusted that during the presidency of His Royal Highness the Prince Consort the society would extend its wings, and that its enlarged benefits would not be confined to Great Britain, but be participated in, by means of the press, by all her colonial dependencies (Cheers.)

The Hon. LESLIE MELVILLE said, as regarded the question of publication, it had occurred to him that it might be desirable that when any valuable paper had been read or any important information communicated, the Council should issue a sort of supplementary paper, which would appear before the next number of the Journal was published. For example, in such a case as that which had been mentioned, the delivery of a lecture on rot in sheep, calculated to be very useful to farmers during the present summer, the lecture might have been circulated among the members immediately after its delivery, and afterwards have formed part of the Journal. Having formerly had a seat in the Council, he felt bound to testify that while he occupied that position he found that when any practical suggestion was made with a view to improvement, the Council were ready to listen to it. He observed no exclusiveness whatever, and from first to last he found that every proposal which seemed at all likely to be beneficial if adopted was treated with respect and taken into consideration.

Mr. WREN HOSKYNs said, in the absence of Mr. Thompson, the chairman of the Journal Committee, he wished to state that Professor Simonds' lecture on rot in sheep would have been published long ago but for the circumstance that the author required that it should be accompanied with plates, for the completion of which the committee were now waiting. The plates would, he believed, be ready in a few days, and there would be no unnecessary delay in publishing the lecture. He must add that he thought the members of that Society should remember that it was a society; that as a society it went to great expense in obtaining valuable information; and that the members should receive first the benefit of the information which it was instrumental in collecting (cries of "No, no"). Well, all he could say was that such was the practice of the Geographical Society, the Astronomical Society, and of other societies with which he was acquainted. In the case of those societies, it was the members who first received the information conveyed (Hear, hear). As regarded the attendance of the Press at the monthly meetings—

Mr. S. SIDNEY remarked that what he had referred to was the weekly meetings (Hear, hear).

Mr. HOSKYNs had supposed that the reporters were already admitted to the weekly meetings, so that the suggestion made would no doubt receive due attention.

Mr. TORR said, in considering the question of finance, it ought not to be overlooked that the Leeds prize-list was a very liberal one, and that this affected the funds. The Council anticipated, however, that the Leeds Meeting would prove a very successful one, more particularly as regarded the show of horses; while he thought it would much increase the attraction if the judges could be seen at work, as was generally permitted at such shows in Yorkshire.

The motion was then put and carried.

On the motion of Lord Heytesbury, seconded by Mr. T. Beale Brown, thanks were voted to the auditors for their services.

Mr. Astbury, one of the auditors, briefly returned thanks, and in doing so bore testimony to the manner in which the accounts are kept.

The CHAIRMAN said the business on the Agenda having

been thus terminated, he had now to invite suggestions for the consideration of the Council.

Mr. BEALE BROWN said he wished to make one or two remarks. He would first allude to the over-feeding of cattle. The late Lord Ducie endeavoured to grapple with that evil, but he met with great difficulties. The judges could not tell at what amount of fat they ought to stop, and that was the chief obstacle to any improvement. He thought that subject was well worthy of the consideration of the Council. There was another evil which it certainly was in the power of the Council to remedy; he referred to the clipping of long-woolled sheep (Hear, hear). The present system of continual clipping was most unsatisfactory. It was deceptive from beginning to end, and the West of England Society had in consequence determined that sheep should be shorn completely down shortly before exhibition. Many men went through the country doing nothing else but clipping sheep; they might be called sheep-sculptors (laughter). No judge under heaven could give a satisfactory award while the present practice prevailed; and he hoped the Council would take into their serious consideration the propriety of ordering sheep to be shorn down a month before they were shown, so that the best animal might win the prize.

Mr. NEVILLE GRENVILLE said, at the Canterbury meeting he gave a notice of motion for a change of the day for holding the general meeting of Society at the annual country show, his object being, not to carry such a motion at a meeting like the present, but rather to make a suggestion to the Council. It appeared to him that the general meeting in the country was at present almost a farce. He attended the meeting at Salisbury, where the president took the chair, and was supported by one or two members of the Council. There were, besides, a strong attendance of members of the press, four or five loiterers, a speech from Mr. Sidney, and that was all (laughter). Nor could he say much more for the meeting at Canterbury, which he also attended; though on that occasion at least one might naturally have expected a good attendance of members of the Society, it being understood that a testimonial would be presented to a hard-working and useful member of the Council, for work which he had carried on under very difficult circumstances (Hear, hear). However, not even that, nor the prospect of an appropriate speech on the subject from their noble President, sufficed to attract a good attendance. The consequence of all this was, that rumours, complaints, and attacks often went forth in the public press concerning the acts and deeds of the Council; and there being no opportunity of contradicting them, they gained ground; whereas if the Council were to meet the Society oftener, and in larger numbers, such things would, he believed, be entirely wiped out (Hear, hear). His feeling on this subject was the result of his observation in the last year. He had read in the newspapers such frequent complaints about the composition of the Council; he had so frequently met with the question "Why is not my Lord This and Mr. That admitted a member of the Council?" that he began to think the Council must be to blame. At a meeting which he attended, he repeated what he had read or heard out of doors to a friend who was present. He asked his friend why so and so were not members of the Council; and what was the reply? Why, that they had been on the Council; but that in consequence of their not having attended the meetings, or paid any attention to the business of the Society, during the whole time that they were members, their colleagues had turned them out (laughter). He thought that was a most satisfactory answer, and he believed that an answer similarly satisfactory might be given to many of the other complaints which were heard out of doors with regard to the Council. It was not at all uncommon for an amateur architect to find fault with a building which had been erected by others, or for a provincial Chancellor of the Exchequer to fancy that no one could manage the finances of the nation so well as himself. As regarded the fund invested, it might be desirable that the bye-laws should be altered, so as to admit of a portion of it being expended for the benefit of the Society; but he had no wish to blame the Council for not having hitherto applied any of it to current expenses. He felt grateful to them for their general conduct, and he considered them entitled to the best thanks of the members.

Col. CHALLONER wished to say a few words with regard to the suggested change of the day for holding the general

meeting in the country. There were two meetings every year in London, where the Council had the advantage of always seeing Mr. Sidney and other gentlemen, who gave them a great deal of enlightenment, and whose views they had in many instances been very happy to follow. The general meeting after the country show was merely a meeting for the transaction of certain business of the Society, which under the charter they were obliged to transact prior to leaving the town which they were visiting. The necessity of holding this meeting was shown by the fact that next year, when the annual show would be held in London, it would be absolutely necessary to hold a formal meeting in the country.

Lord FEVERSHAM wished to add a word or two to what had fallen from a gentleman near him (Mr. B. Brown), with regard to the objectionable condition in which cattle were exhibited—the state of obesity in which they were seen at the shows. Remembering, as he did, that that society was instituted partly for the purpose of encouraging the improvement in breeding animals, it had long appeared to him very objectionable that animals should be spoiled—for as breeding animals undoubtedly they were spoiled—by the state of obesity to which they were brought as a preparation for the shows; and he thought that if, through the adoption of some different course, either by the stewards or by the judges, this evil could be remedied, great benefit would be conferred on those who had valuable animals which they wished to exhibit (Hear, hear). He knew that that opinion prevailed very extensively out of doors, and was not confined to any particular part of the country. Many gentlemen had remarked to him that the shows were spoiling the breeds of cattle. At the last exhibition at Warwick he enquired of a nobleman, who he knew had sometimes exhibited stock, whether he was an exhibitor on that occasion. The reply was, "No; I never spoil my breeding animals by feeding them up for this show." On the following morning he met an exhibitor of shorthorns, who said to him, quite spontaneously, "If this system is to go on, all the best herds in the country will be destroyed" (Hear, hear). At the end of the week the Warwick local newspaper, after giving a general account of the exhibition, said, "As for the stock, it was just like what you see at the Smithfield Club Show." He had heard recently of cases in which heifers and cows, worth £400 or £500 a piece, had died of apoplexy, through this over-feeding, and of other instances in which they had become useless to the owner. He had had the honour of being an exhibitor at the shows of the Royal Agricultural Society for some years. When he first commenced exhibiting, his cattle were not fed up to this extraordinary condition; but he gradually discovered that prizes could not be obtained without such feeding, and hence he had been led in self-defence partially, but not altogether, to adopt that system. He hoped that his friend Mr. Torr, who had some of the best cattle of the country, and his friend Mr. Jonas Webb, who was equally distinguished as a breeder of animals, would direct their attention to this important subject, and see whether some line of demarcation could not be drawn, though he (Lord Feversham) admitted that that was a matter of considerable difficulty. He thought the remarks of Mr. Sidney were well worthy of consideration. As regarded the composition of the Council, that gentleman had told them that "what was sauce for the goose was sauce for the gander;" but he had not told them who was the goose, and who the gander (laughter). He had no doubt, however, that what that gentleman had said would receive due attention.

On the motion of Mr. ORLEBAR, a vote of thanks was passed to the noble Earl in the chair, who thanked the meeting sincerely for the compliment which it had been pleased to pay him. The discussions which took place on occasions of that kind, although they elicited differences of opinion on various subjects, were, in his judgment, very useful. The observations of Mr. Beale Brown with regard to the clipping of sheep, and the prevention, if possible, of the over-fattening of cattle, would no doubt receive due attention from the Live-stock Committee. These subjects had, in fact, long engaged their attention. But the keenness and cleverness drawn out by competition were often more than a match for any rules which the constituted authorities could lay down (Hear, hear). The Council had always borne in mind that that was a society for promoting the improved breeding of cattle. Hence the list of prizes had always been limited to perfect animals for breeding.

The only exception that had been made was in the case of horses intended for exhibition this year, it being considered that it would be a great drawback to the Yorkshire show if, in that great district for the breeding of horses, hacks and hunters should be excluded, simply because they were geldings (Hear, hear). He was extremely happy that they were honoured on that occasion by the president of one of their colonial agricultural societies; and he was sure that the meeting must have been gratified to hear that even at the Antipodes what appeared in the society's Journal possessed great weight and interest. The question of the immediate publication of all the lectures which might be delivered before the society, was one on which there was a good deal to be said on both sides. It was also, he could assure them, a question which had been very frequently discussed in the Council. In such a case as that of Professor Simonds' lecture, where the value of the lecture depended very much on its being published at the beginning of the summer, which was the time when the precautions recommended must be taken, the Council thought that, as in the case of the tract on Horse-shoeing, it was desirable that it should be published in a special pamphlet, and he was sure no pains would be spared by the Journal Committee in getting it out as soon as possible. But there were other papers, on the breeding of cattle and other subjects, the interest of which was not of so immediate a character, which had, what he might term, a more continuous importance, not relating to any particular time of the year, or to any particular epidemic circumstances of the day, and with respect to which it was not so certain that an immediate value would take place if they were printed in a separate form, although they would form valuable additions to the Journal. As regarded the accumulation of funds, Mr. Torr had rightly drawn attention to the fact that the Leeds prize list exhibited a great increase, the Council being desirous to do everything in their power to render the Yorkshire Meeting worthy of the large attendance which might justly be expected in that populous district. Special pains had also been taken to ensure good accommodation for the very large entry of horses which was anticipated. That was a point to which Mr. Torr and Mr. Hobbs had devoted great attention, and he hoped the result would be that no one would have any just cause of complaint. As regarded literary prizes, he did not think the Journal Committee were at all disposed to draw the line harshly, or to be over-critical even with respect to essays which might not be so well put together or so good in substance as they could desire, because the certainty of a prize being always adjudged would naturally attract a considerable number of competitors among those who had turned their attention to the particular departments of agriculture which the prize essays were designed to benefit. Divers revolutions in the proceedings of the Society had been suggested that morning. A revolution in the Finance Committee, which took place some time ago, had been applauded; and as the finances were now in a prosperous state, although in the present day revolutions in finance and dashing budgets were fashionable, yet he thought they would do well to continue their confidence in their Chancellor of the Exchequer, Col. Hood, as long as the balance-sheet compared satisfactorily with the preceding one. With respect to the suggestion, that the Council should do something to increase the number of members, he was reminded by the Secretary that in the report mention was made of one step which they hoped would prove of considerable importance—namely, that of giving members a right to admission to the Shows. So that, at all events, they had not been wanting either in attention to the subject, or in courage to make a somewhat bold experiment. (Hear, hear). Notwithstanding what had been said that morning with regard to the increase in the number of Life Governors, he thought he might justly congratulate the meeting upon that increase, believing as he did that it arose from a conviction that the Society was likely to be useful and stable, and not simply, as had been implied, from the fact that the new Life Governors had found out that a ten years' commutation was a profitable arrangement for an individual member. In conclusion, the noble earl said the various suggestions that had been made would be duly considered, and again congratulated the meeting on the advantages to be expected from the presidency, next year, of his Royal Highness the Prince Consort.

The meeting then separated, the proceedings having occupied upwards of two hours.

THE HERDS OF GREAT BRITAIN.

CHAP. XXVI.

MESSRS. QUARTLY AND DAVY'S.

A busy fair and sale week in Devon was wearing to a close, when we mounted a friend's hack, and set out for a quiet day at Molland and Flitton. These northern strongholds of the cattle land of Edom lie fully seven miles apart, and hence we had to be in the saddle betimes. Our ride over the same road to the great Champson carnival of the day before was quite lively by comparison. We now met only six living beings in nearly as many miles of lane. The footfalls of the sturdy Devonians, who had trudged along, with their gaiters on their legs and their staff in their hands, like pious pilgrims journeying towards a shrine, had long since become mere echoes of the night. The air bit shrewdly, the cold wet shook itself relentlessly from the boughs, which were fast fading off into their Martinus brown, and we felt our note-book, under the circumstances, to be quite a natural enemy. A few memoranda from Dr. Arthur Bury, who penned them about 1706, were all the capital we had in it, whereon to build a chapter that day. They told how the Cornish and Devon men got free of the Norman forest laws by liberal payments of marks and white palfreys; and how in later years they were wont to go as far as they could into the sea at low ebb, and carry the sand in bags to mix with lime, ten miles on horseback, into the interior. So blest, according to the Doctor, was "the marriage of these male and female salts, the one lusty and active, and the other more balsamic and gentler," that to say nothing of "the increase of corne and tillage within the counties," the fields "produced pasture short and sweet, and growing all the winter, so that their sheep know not hay nor water." But it was with the brothers James and John Quartly of the present, and not with the pig-tailed pundits of the past, that we had to deal that day; and the Doctor and his salts were forgotten, as we left the road and cantered up the oak and ash avenue of the West Molland woods. The red deer, one of which gave the late Earl Portsmouth's hounds a fruitless twenty miles without a check, has almost fled from his lair by the side of the Barton Water, but the challenge of the Eggesford to the "red rogue," and the horn of the present Earl are heard amid its copse and dells.

The last Courtenay quitted the threshold of Molland House more than a century ago, in favour of the Throckmortons; but the name of "Hughe Courtenay, sometime Earle of Devon," still lingers beneath the Swan and Boar coat-of-arms, which holds its own over the portals. Only a portion of the grey old grange remains. The room in which we sat was once the chapel, and the "*Vita-fugit*" motto on the faded yellow-letter

sun-dial, which clung to the thickly-ivied gable, was never more trite and true in its lesson.

Mr. James Quartly's holding consists of about 700 acres, he best of it, though not very strong feeding land, on blue slate and shillit, and the remainder on blue-stone brash. Four hundred acres of it were once a rough sheep-walk, covered with heather; but about a fourth of it has been broken up, and sown with turnips or laid down to grass; and the flock have done full justice to the outlay. The turnips, which like his neighbours' were fearfully bad this year, are swedes and golden yellows; and the mangels, of which not many are grown, long yellows and yellow globes. The corn-growing is on a most primitive scale, simply for consumption in the house and on the farm, and scarcely a hundred bushels of wheat are sold yearly out of Molland parish. To breed Devons, pure and simple, is the sole charter of the farm, and Brocklesby has not been more true to Will Smith's dying words, to "stick to the old Ranter sort," than James and John Quartly have been to the rich legacy of breeding models, which their uncle Frank and their father handed down to them in the Pretty Maid, Tulip, Picture, and Curly families. They had no names in those great days, but still Devon breeders were a herd-book to themselves, and had attained quite a masonic accuracy in their oral lore, before Captain Davy stepped forth, and fixed 1820 as "the year of memory." Sillivant (120), who was sold as a yearling for 97 gs. at one of Mr. Frank Quartly's sales in 1836, was the most important of Mr. James Quartly's earliest purchases, and in due time Mr. Childe of Kinlet secured him for Shropshire. Prize (108) had been purchased by Mr. Childe's father some years before, and his "trade-mark" was so distinct, that when James accompanied a friend to the Smithfield Show for the first time, in 1838, when breeds were not kept distinct, and found a little ox cut off by the Shorthorns in a corner, but still with the gold-medall card over his head, he "claimed him at once for a Prize," and had his claim allowed as soon as his owner, Mr. Clarke Hillyard (who had offered in the previous August to show him against any ox in England), could be cross-questioned on the point. Pretty Maid (366), who was in her bloom about twenty years ago; Tulip (451), the dam of Forester (46); and Curly (92), the dam of Hundred Guinea (56), still live on canvas at Molland House, and so do Pretty Maid (366), a daughter of Curly, and Rosebud (the dam of Napoleon), "the grandest cow ever seen at Molland," and a winner not only as a heifer in-calf at the Lewes Royal, but of the first prize and silver medal both at Birmingham and Smithfield in the winter of '59. There, too, are the brace of steers, both of them by Earl of Exeter (38),

which Mr. Quartly picked from his herd for Mr. Farquharson at nineteen months each, and found in due time at the head of their Christmas class, one at each place, in the self-same year.

We had cast one look from the garden plateau over the busy water-meadow beneath, and the windings of Molland Wood, and then following Mr. Quartly and his one-armed herdsman, whose hook never cools in its labours, we were introduced to Napoleon's two sons, King of the Bretons and Lord of Kerry, which were first and second in the yearling class at Canterbury. Writers had sneered at the whole of the Devon classes there, as gradually approaching the vanishing point in size; and Mr. Quartly had not scrupled to accept the sneer in its integrity, and christen his bulls in keeping with it. "The King" is from Milkmaid, and "The Lord" from Primrose, both of the Curly family; and it is remarkable that while the Devonshire men at Canterbury held with the winner, the Somersetshire breeders, with the exception of Mr. Hole, should have given the first prize to "The Lord." "The King" is a more stylish-looking animal than "The Lord," who carries a great amount of flesh, has enormous substance, and remarkably fine rumps, and is very deep in his flanks. There was, however, a Devonshire demurrer to his head, which has the horns set on a little too much back. He has gone to Mr. Palmer's, of Stoke Climsland, in Cornwall, to take the place of Warrior (half-brother to "The King," and winner of the senior bull prize at Canterbury), who returns forthwith to Molland. The latter is to be crossed with Napoleon heifers, with a view to improving the fore-quarters, which constituted the greatest fault in their sire.

A walk down an ash-shaded lane, brought us to Church Close, where the cows of the herd mustered nineteen strong. Out of these, a dozen were never in a show-yard, and the other seven were all first or second Royal winners. Graceful and Sylph, as they lay together, invited a gentle kick-up, that they might fight their Salisbury battle over again, which Graceful's quality decided in her favour. The Bath and West of England also gave her a first as an in-calf heifer, but Mr. Turner beat her at Lincoln, with one by Earl of Exeter. There, too, was Graceful's daughter Gaiety, the smutty-faced Honey-moon (1403), who is not breeding, Dolly Varden (142)—herself the second yearling heifer at Exeter, and dam of the second yearling heifer at Carlisle, and the first in-calf heifer at Chelmsford—Duchess of Chester (1299), whose coronet was not given her for nothing; and Stately (1058), who has lost two out of her four calves, since she headed the Royal in-calf heifers in '55, and the cow-class in '56. The dappled Hebe (769), who is only one cross off from the Picture family, had a fine head and hind-quarters, which no one could overlook in a crowd. Curly (1248), and Colly (1222), never left that pleasant valley on the slippery paths of show-yard ambition; but Primrose (977) (granddaughter to Pretty Maid, grandniece to Hundred Guinea), was first

yearling heifer at the Gloucester Royal; and Bertha (1179), the granddaughter of Beauty (21) (who took a first prize at the Exeter Royal), came back with her own first from the Canterbury cow-class, beating Turner's Vaudine for the head prize, as Duchess of Chester had done both at Chester and Warwick. If Sylph (434) had no such honour to boast, she had the domestic triumph of being the grandam of a Salisbury first-prize winner from Lily (1446) when she was only four-and-a-half. Twenty-five yearling heifers and steers in one field, with Stately's and Graceful's and Sylph's among them, and nearly all by Napoleon, formed another strong instalment of the herd, which at present can count about eighty. Mr. Quartly considers it a poor year that does not bring its twenty calves, but during the seven that he used Napoleon, his chances were, for two seasons in succession, very seriously jeopardised. Sure as this bull was at the beginning and end of the season, he was quite fallow for three months in the middle of it, and then eight calves dated from one forenoon. Still, he has fully earned his right to be regarded as the very Touchstone of Devonshire stock, and latterly gave no audiences under five guineas. He will be nine years old this grass, and has improved, like wine, with age, as the only fifteen of his calves shown took first prizes last year, and Mr. Mogridge's famous prize-heifer was his great granddaughter, through Duke of Sussex (406). This feat is a worthy parallel to the Warwick Royal one, when fifteen out of the seventeen Devon prizes fell to the Quartly blood. Napoleon was a most distinguished member of the prize-ring in his day, and if the judges at the Lincoln Royal once placed him in the yearling class below the rank he held at the Bath and West of England, he regained his premier honours next year, in the castle meadows at "Merrie Carlisle." It is not Mr. James Quartly's intention to exhibit at Leeds this year. Sylph, Duchess of Chester, Primrose, Gaiety, and Placid have all had bull-calves since our visit, principally by the Duke of Chester and Napoleon; and Colly, Bertha, Famous, and Topsy have swelled the heifer list. Graceful has, we regret to say, lost her Napoleon heifer, and Hebe, Milkmaid, Stately, &c., have still to calve.

The aforesaid lane of ashes, which are most frequently converted into hurdles, joins the farm of James Quartly with that of his brother John's at Great Champson, and thither we rode once more, to pause for a few minutes among the relics of the herd in the Mead Park. Nearly all the three dozen had gone to their new homes, except the massive Brown (1196) from Beauty (29). Seventeen females of all ages were left, and although Pretty Maid (367) (the dam of the Duke of Chester), which had slipped and broken two of her pelvis bones, has since died, two heifer and two bull calves from Pink, Handsome, Playful, and Lovely (all four Royal winners), and a heifer calf from Florence have duly arrived, so that with King of the Bretons and Warrior handy at Molland, the Great Champson herd runs no risk of being wiped out.

Playful (354), and her sister Countess (595) and daughter Florence were all rare props for the future, and so was Pink (951), a grand cow with a light milking neck, and a winner at Chester to boot. Flower (1355) a combination of three Royal prize bulls, and Pretty Maid (366), and Curly (192) to boot, had been first in the hammer order of merit, at 51 guineas the day before, and gone to Philip Halse's homestead. Flower's yearling had attracted Mr. Farquharson's commissioner; Peace and Plenty (935) and Dairymaid (1264) were on their way to the Norfolk Farm at Windsor; Daisy (1269) and Famous (1319) were bought by Mr. James Quartly; and the gay short-legged Duke of Chester, with that elegant outline and beautiful touch, which carried the day both at Warwick and Chester, headed, along with a daughter of Dairymaid (the second prize cow on The Roodee), the list of the fashionable departures to Cornwall, where they are now in Viscount Falmouth's herd.

The little village of Molland, which has so long been the Kirkleavington of Devons, is made up of a union of dells. On the chief knoll stands the church, beneath whose shadow, five years ago, "Frank Quartly, aged 90," was laid to his rest; while on an adjacent one in Mr. Mogridge's farm, a tall Maypole is reared by the loyal villagers, not marked "*Anno Pacis*," but still to record their rejoicings when the peace between Russia and the Allies was signed. Lovely, Laura, and Flora of old Curly blood, and Abbess (1141), a daughter of Young Forester were moving red spots on the green sward beneath it; Young Spot (1651), and Profit (993) from the same herd, roamed lazily along the water meadow in the valley, and when Mr. Mogridge had turned out the apple of his eye from her shed, we were not long in making up our minds that a Smithfield medal was looming, and never would believe the contrary, till we learnt from Mr. James Quartly's official lips at "the private view," that she was only the reserve one. The quaintest part of the village is the north end, with its orchards, its ivy clusters, and its thatched farm-sheds; and the sombre porches of Great Champson were all alive with guests on that September sale morning. The assembly quite wore the air of a sedate family gathering of men bent on business, and a cheerful day as well. There they sat, like a Devon senate, blew the social cloud, stirred the toddy and their warm ale, watched the herd of struggling ponies and cobs as they were drafted, one by one, from the yard beneath, and discoursed of "bullocks" and turnips. Coming after great central sales, where so many idlers draw up, merely seeking what they may devour, and shutting their mouths tight enough when the ring is made, it was quite a pretty pastoral picture, which Frith would have drawn so well. Merson, Ridsen, Passmore, the Turners, Tanner Davy, Mogridge, and the Halsees were among the Devon delegates to the Rump Parliament, which met to pledge each other in the oak winniscotted chamber, at the head of which old Frank Quartly still lives on Mogford's canvas with Cherry (66)

at his side, and his hand tenderly laid on her second prize Windsor yearling Playful (354). Warren, and the Holes, were at their posts of duty for Dorset and Somersetshire; Cornwall sent its Anstey, Palmer, Sobey, Parsons, and Tremayne, while Heriot was proxy for its Viscount Falmouth; Robert Smith had quitted his Exmoor cobs and water meadows for the day, not so much to scan the Dukes of Chester and Earls of Exeter, as the Young Ports and "the descendant of the Queen's Arab;" and Brebner had passed on from Barton, to speak up thrice more for the interests of Berkshire and Royalty.

Our route from Great Champson to Flitton lay over rather a wild country at the outset, devoted to ponies, heatherpoults, and notts. Countless shades of green found their types among the furze. The beech hedges seemed harder as they stole up the higher ground; and one of them, nearly a mile and a half in length, divided Sir Robert Throckmorton's property from that of the leaseholders. Leaving the moorland, Devon scenery presented itself in a still more beautiful aspect; and as we passed Twitchin Town Wood, with its vast dwarf-oak copses, from which many a straight-necked one has been viewed away, we could well realize the old saying that, like the "Rhine-land":—

"Where the tailor blows his flute,
And the cobbler blows his horn,
And the miner blows his bugle,
Over mountain-gorge and bourne,"

every man in Devonshire loves the music of hounds.

What Torr's and Jonas Webb's and Stratton's are among Shorthorns, in point of magnitude, the Flitton herd is to "the red kine." For 150 years the Davy family have kept up their charter; and the herd which was handed over 60 strong to Mr. James Davy, at his father's death, has now swelled to nearly double. Upwards of thirty cows come regularly to the pail; and America and Australia take a draft of several young bulls and heifers each year. Mr. Davy keeps up, like the Messrs. Quartly, a regular bull trade, and generally sells about 13 or 14 yearlings for use either in England or abroad. Flitton can claim about an equal number of male and female prizes, and sent its representatives to the Royal show, from its very commencement in the Oxford Port Meadow. Oxford (89), by Forester (46), opened the Royal ball there, but he had been sold previously to Mr. Matthew Paul; and though Nelson (89) had to bow to Mr. John Quartly's Earl of Exeter (38) at Windsor, he did what far surpasseth show at home, and Mr. Davy still speaks of him as his modern sheet-anchor. His rare loin was a little counterbalanced by somewhat upright shoulders, a point in which Earl of Exeter was especially good; but Eclipse (190), his Tiverton winner, put all that right; and Napoleon III. (464), by John Quartly's Earl of Exeter, took first honours at Salisbury, "against Prince Albert, Turner, and all the lot." A yearling-heifer prize, at Bristol, in 1842, was the first Royal one Mr. Davy won

for females; but Old Fatrump, the great-grandam of Eclipse, was first at the Devon Agricultural at Exeter; and Newton and Cardiff conferred similar honours on Curly (97), the dam of Napoleon III. Since Salisbury, Mr. Davy has scarcely sent an animal to the Royal; but, in spite of the scarcity of fodder, which has made so many owners decide not to "go on" with their beasts, we expect to find him firm in his September resolve that "Prince Alfred and Rose of the Valley shall take up the running at Leeds."

This curly son of Lady Bess (820) was the inmate of the first shed we entered; and hard by him stood his half-brother, by Napoleon III., equally noticeable for his wide loin, great evenness, and length of rump. There, too, was a worthy half-brother of Napoleon III., whom Mr. Davy used for two or three years. About half the herd are by Napoleon III.; and Mr. James Quartly esteemed him so highly, that he sent the dam of his Napoleon, her sister, and Napoleon's sister to him. From this point, the herd began to crowd upon us, detachment after detachment, in an almost bewildering profusion. We had scarcely made the acquaintance of four bull and three heifer-calves, including a very nice handler by Prince Alfred, from Pretty Maid of Rose Ash (1685), a calf by Palmerston (476) (who died after Mr. Davy had purchased him back from Lord Portman), than the herdsman and herd-boys arrived, with four more, bound for the Shute meadows. Curly (97), the dam of Prince Alfred and Napoleon III., was leading the van; and behind her, Cinderella (70), by Nelson (83), the biggest (Brown not excepted) that we had seen in Devon; with sweet Lady Bess (820), and her dam Curly (97), worthy of her, every whit. Then we had our first peep at the stock of Eclipse, who has gone to Australia, in Young Pretty Maid, a cow as remarkable for her length as her peculiar yellow tinge. There, too, with her thin, neat head and neck, and shape like a forest-deer, was another, for which Mr. Davy refused a high price from Lady Poltimore; while Modesty (1496) had no just cause to veil herself in the distance.

Some Exmoor ewes shared the Flitton Green Meadow (part of which is flooded and cut four times a-year) with another lot, old and young. Among them we noted the Eclipse heifers from Gaylass and Cherry—the latter, whose dam was sold to Lord Portman, of great promise and size; while Treasure by Napoleon the Third, and a heifer by Napoleon from Young Picture, were true to the beautiful fore-quarter, which is such a Devon speciality. The leakings of the flood meadow rather cost us a wade, to get at the old bull shed. Napoleon the Third, Palmerston, Nelson, and Eclipse were all kings here in their turn, and a bull-calf by Napoleon the Third from Curly (97) was now its principal tenant. "Hark back to the Shute Meadows!" was then the word, where Pretty Maid (1685), the smallest there, but beautifully light in the bone, and her daughter Flitton Maid, a cow with a very rare middle

by Eclipse, and the neat Lady Flitton awaited us, with Profit (992), the dam of Lord Fortescue's bull Flitton (414). Meanwhile the herd boys had been scouring the gorse brake to secure us a peep at the Palmerston blood, six of which came scampering down the lane, with their dams, tails erect, to the levee. Five out of their six months of sucking were over, and they all did the amplest credit to their nurses—none more so than the only heifer among them, from Young Queen, and a bull calf from Young Picture, with hair as long and shaggy as an Argyle, and a dewlap extending to his very lips. This robust character and development of dewlap is the especial type of the get of this bull, who died before he could be shown at the Royal, from a rick in the back when he was bulling.

Flitton Old Tree, that far-famed tryst of the fox-hunters, made us halt for a moment on our way to Cross Close, a little farther up the hill, where Princess of Prussia, of splendid size, and with a back like a table, first caught our eye. Already she has won a prize at Cardiff and the Bath and West of England. Three heifers by Napoleon the Third from Young Flower, Pink, and Beauty, by Eclipse, were good, and Rose of the Valley, amply fulfilled our expectations. Some more bull-calves roamed the Barns Close, and there was an apparition of yet more on a distant eminence; but we had seen enough cows and bulls for one week, and were glad to beat a retreat through some sheds and Dutch barns, and sit down for a space to rest. Our day's toil, however, was not ended—and the shadows had long since descended on the hills, ere we had reached, by slow degrees, the top of Five Burrows, and at last descried the twinkling lights of Emmett's Grange, which guided and bade us welcome to the Knight ponies* and the "Bobbies" of Exmoor.

CHAP. XXVII.

THE BRANCHES PARK HERD.

That life would be as nothing without enthusiasm on some point or other, is an axiom which the veriest cynic has never cared to gainsay. Under its influence "the weaker sex" have long since spurned the conventional limits of cross-stitch, tambour-work, and Broadwood's Patent. Miss Anne Richards was wont to leave her coach-and-six, and beat for hares, the live-long day, at Ashdown, with her kirtle up to her knee. The white plumes of the boldest tenants of the side-saddle are seen, season after season, in the front rank over those breezy Wiltshire plains, or the pasture lands of The Quorn. Mrs. Ferguson Blair, the authoress of one of the very best manuals ever written on poultry, can aver that she has won four hundred and sixty-seven prizes up to this date, and that to attend forty yards a-day, and hatch a thousand chickens a year, is her especial crown of rejoicing; and

* See *Sporting Review* for October, 1860.

Lady Pigot's equally legitimate and unceasing aim is to be foremost among the best in the shorthorn classes at The Royal. The taste for the Red, White, and Roan had not grown up with her ladyship from girlhood. In fact, it was not until the autumn of 1856, during a residence among the grouse hills at Oban, that she began to care for cattle at all, and then it was not the sight of any Athelstaneford or Southwicke shorthorns, but of a quartet of shaggy West Highlanders belonging to Mr. McFaydzen, of Glen Machree, which first kindled her ambition. The lot consisted of three white heifers under a year old, along with a three months' dun bull, and 140 gs. was the price. The bull's head was not exactly orthodox; but his development of frame was almost faultless, and well entitled him to his title of "Glen Lonan's Chief." Fortune was not coy in dispensing her favours; as "The Chief" was five times in the Show-yards, and never beaten save once, and then by Lord Breadalbane's at Aberdeen. The Dublin Society gave him a silver medal; the Bath and West of England followed suit; and the Chester Royal put the seal on this first venture, by awarding him the prize challenge cup, for the best bull of any breed save three. History says nothing of the three heifers, except that a Newmarket butcher got them; and ere long, as other purchasers only looked and rode away, Glen Lonan's Chief followed them to the shambles, leaving nothing but his picture in her ladyship's boudoir to upbraid her for deserting her first love, and a calf called *Highland Lassie*, whose heifer calf by Sir Roger is quite like a curly red Durham.

Her ladyship was perfectly guiltless in the spring of '57 of the great antagonistic creeds of Booth and Bates, and of the endless disputations and searchings of heart to which they have given rise; and, singularly enough, her first herd visit was to Captain Gunter's at Earl's Court, Brompton. A bid and a protracted treaty for Autumn Rose was the result of that afternoon's saunter through the Duchess domains; but it came to nothing; the rose was ultimately destined to bloom in the Imperial stalls, and her ladyship purchased Happiness for 250 gs. from Mr. Jonas Webb. She was a fine, large, heavy-topped animal, by Lord of the North (11743), and had a Cheltenham (12588) bull-calf, which was styled Happy Land, and sold on Mr. Wetherell's sale day. The other, which was also a heifer, by Cheltenham, died; and she herself caught a severe cold, when returning from the Dublin Show (where she took the first prize and silver medal, and the gold medal, as the best cow), and sank, as her ladyship believes, from the too free use of the fleam. With Sir Robert Pigot this cow was always an immense favourite, and he has still his doubts, whether she has left better behind. Cheltenham himself was the next purchase for 120 gs; but the Fates were still bitterly adverse, and in the December of '58 he was sent up in vain to London for sale, and a severe cold on the lungs, which he caught from waiting for 8 hours in the rain and an open truck at the Cambridge station, soon

sealed his death warrant, without a butcher. A few cows, with one or two crosses, in calf to Cheltenham, and selected by his Grace the late Duke of Rutland, formed, along with Second Duchess of Glo'ster and Princess of Saxe Weimar, from Mr. Jonas Webb, the relics of the first attempt at forming a Shorthorn Administration. Upwards of £600 had been "lost in the first year from deaths and inexperience;" but still, as her ladyship writes, "I was determined to persevere," and Princess of Saxe Weimar was the turning point. This heifer had accompanied Belvoir Lady to the quarters of Sixth Duke of Oxford, and the produce, a rich roan heifer, sold at three months for 50 gs., to Mr. Rich, of Didmorton, Wiltshire, proved the first good item on the credit side.

This brings us to the end of 1857, when the Babraham premiership ended, and that of Warlaby began. Lady Pigot's first introduction to Mr. Richard Booth was at Salisbury, where the two-year-old heifer Happiness found herself in "the best of all good companie," with Rose of Athelstone and Queen of the May, and shared in the universal commendation of the class. The sight of the latter made her ladyship take the resolve in favour of Booth blood, and accordingly, with characteristic energy, she offered, by letter, a few weeks after, to rent Crown Prince for a month, at any price that might be set on him. The response was in the negative, and the Warlaby code on this head was alike sternly maintained, when a second offer came to send Happiness and three other cows at 25 gs. a-piece. Foiled in her efforts at the fountain head, her ladyship rested for a time, and then paid a visit to Mr. and Mrs. Carr, at Stackhouse, in the autumn of '58, and purchased and conveyed home with her, in due mail-train state, her first Booth, to wit, Baroness Warlaby, for 150 gs. She was a pretty and stylish sort of heifer; and after winning head prizes both at Ipswich and Glasgow, and breeding Pride of the Valley (who has since been sold to the Spanish Government), by Lord of the Valley, and Prince Arrogant by Prince Alfred, she brought back her price from Mr. Leslie, M.P., of Glasslough Castle.

November the fifth, of the same year, was her ladyship's first "quiet day at Warlaby." Aldborough had been already visited, and Mr. Wetherell had turned a deaf ear to the offer of 200 gs. for the yearling Stanley Rose; and Mr. Booth was equally obdurate, when 350 gs. was bid him, for Orange Blossom, a very doubtful breeder. Like Tennyson's Lord Chancellor,

He dallied with his golden chain,
And smiling, put the question by,

when he was begged at all events to "*sell something, if it's only quite a little calf*," and recommended the fair persecutor to visit his old friend Jolly in the village, and give him seventy guineas for Empress of Hindostan. No advice could have been sounder, as a 30 gs. advance was very shortly afterwards offered to her ladyship for her bargain, and as promptly refused. Stanley Rose had, nevertheless, left a very deep impression; and in the March of the next year, she was transferred by a

300-guinea "closer," through Mr. J. B. Booth, from the Durham to the Cambridgeshire meadows. Owing to a mistake, she was not entered at Warwick; but the judges decided two to one in her favour against Duchess 77th at the Durham County; and their decision was reversed both at Hull and Ulverstone. This daughter of Earl of Derby and Moss Rose had a very bad autumn of it after her show travels, and sank away almost to nothing from successive attacks of inflammation of the lungs. Winter, however, brought bloom and flesh once more; and getting, by another mistake, into a fat class at Framlingham, she made very short work of her opponents, and set the sceptics prematurely groaning over her sterility and looming demise.

In spite of this little Stanley Rose fancy, her ladyship, during 1859-60, kept steadily getting together cows, with as many Booth crosses as possible. Mr. Carr furnished Hildegard, Rowena, Cherry Empress, Violet, and Red Rose; and then came a second lot, to wit, Lady Grandison, Mistress Mary, Rosy, Lady Bird, and Charlotte, the last four in calf with heifers to Valasco. Woodnymph, Baroness, and a Royal Buck cow were furnished by Mr. J. B. Booth; Isabella Hopewell, Cherry Queen, and Spicey were the first arrivals from Athelstaneford; and we do hear of an exchange which may cause Mr. Douglas's Ringlet (the dam of Maid and Queen of Athelstane) to follow suit. Mr. Barnes' Queen was an object of especial ambition; but even 1,000 gs. for her and Victoria could not draw the Irish Booth of his pair. Eventually Victoria crossed the Channel for half that sum, accompanied by a gallant luck-penny in young Brian Boru, a son of The Queen and Dr. M'Hale. Rose of Promise, Pride of Southwicke, and Rosamond were, shortly after, the fruits of a morning at Mr. Stewart's sale; and then her ladyship became so fascinated with the blood of Sir James the Rose, in Queen of Athelstane and Almack's Belle, that although Mr. Douglas would hear of nothing less than 500 gs. for the one, and 200 gs. for the other, the hopes of giving a successful *defi* to the twins and Soldier's Bride at Leeds was too strong; and in an evil hour she determined to risk it. The Queen of Athelstane won two small firsts at Skipton and Keighley under her new ownership, and there her uninterrupted career of victory ended. She went on apparently well, reaching six-feet-eleven in girth, till December, when she began to lose flesh externally. Still, although it was rather vexing to see that Almack's Belle was beating her, not much was thought of it, till about half-past seven one February morning, when John Ward found her in her box in the big barn, breathing very fast. A message was immediately sent to the house, and Mr. Major was telegraphed for to London; but it was soon evident that there was no chance. The shorthorn beauty had turned blue at the nostril shortly before ten o'clock, and lost all her circulation; and then, having made a last effort to walk from one side, where she had been leaning, to the

door of her box, she sank down, rather than fell, and died without a groan. Her heart was found to be so completely encased in fat as to impede its action, and at least seven stone was taken out of her. She was four months gone in calf of a red-and-white heifer to Lord of the Valley, who filled up, along with Sir Roger by Windsor, the space between Prince Alfred's hirings. This seven-year-old son of Crown Prince and Vivandière, who now reigns at Branches Park, has passed quite a royal existence. For three seasons he was at H.R.H. The Prince Consort's Home Farm at Windsor, and migrated in 1858 to St. Cloud. In 1859 her ladyship hired him for 150 gs., and the Warlaby tariff was increased to 200 gs. after his season of absence at Mr. Dudding's.

Highland Lassie, along with a Breton, a Polled Angus, and an Alderney, form a small coterie of their own with the dairy stock at the farm, where her ladyship also cultivates the white breed of pigs. In this pursuit, as in every other, she flew at high game, and gave Mr. Fisher Hobbs 35 gs. for a brace of his black sows. The neighbourhood did not take to them, and hence there was nothing for it but to sell off; and a 20-guinea sow of Mr. Wainman's breed was the first white tenant of the styes. Then came an improved Middlesex from Mr. Barker, of Sunning Dale, which was rescued from a pen at Bakerstreet, and reduced to a breeding state. A little sow of Mr. Wiley's, and a boar from his H.R.H. Prince Albert's, were afterwards purchased for the sake of the cross, and about a score of their produce are sold or fed off annually. The pig history of her ladyship's farm is not without its night side. It was said of the famous Dragon of Wantley, that when the supply of geese and turkeys was exhausted, he could make a meal off a church; and so the notorious "Manchester Gang," when shorthorn men got to know them, were not too proud to stoop to pigs and washing-machines. They marked one of these sows for their own; and it cost Sir Robert and his lady a goodly sum to travel to Cottonopolis, and rescue her, after divers conferences with the police, from the knife of the butcher to whom she had been sold. Her ladyship's boudoir contains no evidence of these tastes, with the exception of a pig study by Morland. A little cow piece by Cuyt also struggles ineffectually in the interests of High Art, as Happiness, Baroness Warlaby, The Empress, and Glen Lonn's Chief—some of them, if not painted originally, at least painted over by her ladyship—decide the issue in favour of the Low. Prize medals are amusingly interspersed with other knick-knacks and bijouterie on the tables; and the spreading horns of Cheltenham hang on the wall in true allegiance to the death, with the neater coronet honours of Happiness beneath. Queen of Athelstane will have her niche as well; and a London taxidermist is exhausting the resources of his curious art in preserving her head and neck, which will be exhibited ere long in the Kensington Museum, where a Devon and a Poll Angus are embalmed already.

It must not, however, be supposed amid the record of such enthusiasm, that shorthorns exercise a spell over her ladyship, to the exclusion of the other farm details. No one can enter with greater spirit into the general management of the land, and grudge expense so little to keep it in heart. All the implements are from the best makers, and have been personally selected for their efficiency in the show-yard trials, and their adaptation to the peculiar soil. Steam ploughing has also occupied her ladyship's thoughts, and she informed us, that she trusts in due time to submit to the public an engine and plough of her own invention. Books of authority upon this and many other subjects of scientific farming, as well as a chemical chest, met our eye; and amid all these more alluring mental activities, the dwellings, education, and comfort of the labourer, and his relation to his employer, have formed the subject of her own and Sir Robert's most anxious care.

Branches Park, near Cowling, to which they removed from Chippenham Park, last August, lies about six miles from Newmarket, in the Cheveley direction. Earl Stamford's string, some five-and-thirty strong, with Diophantus third, and Febrifuge's golden chesnut glancing gaily in the sunlight about twelfth, were taking a slow canter over the Bury Hill; and as we rode that morning up the beech-shaded ascent, we thought how often poor Frank Butler and Uncle Sam were wont to walk, growling in the spirit, along it, and shed many a weary pound to reach their eight stone seven. Branches is supposed to have been the hunting-seat of Henry II. and Faye Rosamond, and in the absence of any regular history of Suffolk, the tradition derives support from the fact, that a famous grazing piece in the park is still known to cowherds as Rosa's Lea or Rosaley. There are also some remains of old painted glass in Cowling church, which, although barbarously repaired, indicate sufficiently, by the blending of castles, crowns, and English roses, that some monarch once took his ease in the parish. On the site of the present house, which was built in the reign of "good Queen Anne," and had a couple of wings built to it by Mr. Dickens for the special reception of the Prince Regent on one of his Newmarket visits, there once stood a small castle or castellated keep, surrounded by a moat, part of which still lingers in the gardens. Her ladyship is quite at issue with the commentators, who maintain that the royal residence was at Kirtling Castle, and argues that castles with such architectural pretensions as Kirtling can show, were not found in England so early as the eleventh century. The farm adjoining the house, which is rented from Mr. Simpson, the present proprietor of the estate, consists of 375 acres, and another of 150 will shortly be added to the holding. The soil varies, but may generally be taken as 18 inches of stiff loam on the top of clay, and we needed no better *prima facie* proof of its strength than the splendid oaks it has reared. The season prevented us from seeing the grass in anything like perfection; but we understood that her ladyship had been duly advised by her consult-

ing counsel, the judges of the little cattle show she has established at Newmarket, to graze the park this summer.

The herd, of which from 20 to 30 are for private sale, number about seventy at the Home Farm, and about a dozen at the other, which is shortly to be given up. Her ladyship writes us:—"There are nineteen pure Booths among them; five out of the rest have six crosses of Booth, and the others have four, or at least two." Their pedigrees are set forth in full in the annual Branches Catalogue, which, with its naive confessions and its interesting foot-notes, promises to open up quite a new era in this once dreary field of *g. g. g. d.* literature. If Mr. Carr has been more brief in his notes, he has gone a step beyond her ladyship, and called, for old Windsor's sake, the easel and the camera to his aid.

On our arrival at Branches, we found them ready to our hand in three divisions—the milking cows in Rosaley, whose hedge divides Cambridgeshire from Banstead Park Wood, in Suffolk; the higher-bred ones on the other side of the iron rails in the park; and the bulls, the calves, and the Dublin-bound in the yard. The great majority of the cows have nursed their own calves, after passing through a winter of well nigh fodder famine. The mangels and turnips were a farce, the hay was bad, and, in fact, oilcake was the only mainstay. This state of things had touched *Roxana*, a daughter of Lord of the Valley and Rowena by Hamlet, very lightly, and if she were not too small to please many judges, she would be good enough to go on with for country shows. So far, she has been merely shown at Skipton as extra stock, and earned a high commendation at Keighley in Queen of Athelstane's and Almack's Belle's class, without any "training" to aid her. She has all the nice hair and colour of Duchess 77th, and her walk alone is one or two points in her favour. Her own sister *Baroness*, a great milker, has more length, but not the same make-up, and her coarse head rather sets one against her. Next her was the good-haired *Lady Salisbury* from Mr. Dudding's sale, whose deep forequarter, great breast, strong hips, and peculiar top stamped her as "Baron Warlaby for a ducat." Breeding is so much her forte that she has produced three single calves within twenty months! *Princess of Saxe Weimar*, who was once second to Mr. Stratton's Warwick prize-cow Matchless 4th at the Bath and West of England, seemed a nice even-made cow, with capital ribs and loin, and a short neat leg. *Hildegard* by High-flyer (11576) was in poor condition, and rather plain behind, but Booth to the life in her head; while *Rosebud*'s specially savoured of Prince Arthur. *Joan of Arc* was equally faithful on that point to her sire Vanguard, and her best characteristic is her talent for the dairy, which she develops for about seven months in the year, at the rate of 23 quarts *per diem*. *Dahlia* has required milking three times a-day for five months in the year; and *Rose of Braithwaite* has equal reason to boast of her udder as *Eyebright* has of her neat bone.

An iron railing separated these simple maids of the milking-pail from the more thoroughbred occupants of the park. Old *Spicey* stood ruminating under an oak, and bearing even in her old age all the stamp of a fine cow, with the true Booth head, and horns rather drooping; and near her, by virtue of true Scottish clanship, was *Rose of Promise*, by Heir-at-Law from Rose of Autumn, a two-year-old heifer of great length, and well-ribbed up, and purchased for 275 gs. at the Southwicke sale. *Mistress Mary*, by Baron Warlabry from a Royal Buck cow, was there, in the shape of a light roan cow, with not much Booth character about her; but *Magnolia*, by Majestic from a Vanguard dam, an 150-guinea purchase at three months, took our fancy not a little. Perhaps she wants size; but when her neat fine bone, her sweet head and horn, and remarkably gentle eye, to say nothing of her nice dark-roan coat and handling, are set against it, the objections become remarkably small. Her breast is very good, but hardly forward enough. The twins, *Red Rose* and *Flower of May*, can be better gauged by the pail than by the eye, but the latter produced a prize-winning calf at Redcar in '59. Then we came on our old Westland friend, *Victoria*, by Hopewell from Britannia by Albion, but we had never seen her out of the house before, and we had completely forgotten her. She is a true, well-made cow, and looks like a bull-breeder. In point of size, the level fine-loined *Lady Sarah*, by Baron Warlabry, bought at Mr. Ambler's sale, quite overpowered her, and is, in fact, quite the largest in the herd. Three firsts and two seconds make up the sum total of her winnings so far, and her Ladye Ælfrida began to copy her very early, both at Keighley and Skipton. Standing near the hedge was *Woodnymph*, a daughter of Sir Samuel, whose roan stock seem to carry their distinctive mark very much more than the white. She was bred by Mr. John Booth, and has five Booth crosses in her, going back to Leonard. Her shoulders are nice, but she has been delicate, owing to the loss of her calf, which was found dead in the park by the underherdsman when Ward was away at the shows. *Cas/anet*, who is very neat about the head and shoulders, has also paid the penalty in her looks for early fecundity, as when she was very little above three years old she had produced three calves, two of them twin bulls. There was no mistaking the paternity of *Pride of the Valley* from Baroness Warlabry; a well-grown thick heifer by Lord of the Valley, with a chubby head, rather plain in the quarters, and a little upright in her shoulders. *Cherry Empress*, by Captain Balco from Imperial Cherry, retired from public life after she had won one first prize at Ipswich; and she and *Cherry Queen* by Heir-at-Law, a great-grandson of the famous Bracelet, were difficult to whip apart, the one having the pull in her forequarters, and the latter in her head, which her ladyship compares to her dam Birthright's. The heavy-fleshed, plain-quartered *Violet* was a remarkable cow, gaudy in her roan, and robust rather than elegant in her

frame and head, but still of a stamp that the eye too seldom rests on. *Isabella Hopewell*, with her horns curved and almost flush to the forehead, has nothing like her companion's proportions, with good substance and quality, and is becoming patchy with her tenth summer; and *Ladybird*, of a grand old Fitzleonard tribe, and only spoilt by her Sir Thomas (13740) cross, was all to pieces with milking, and could only plume herself on an immense udder.

And so, from the meadows, we found ourselves, after a couple of hundred yards' walk down the lane, at the farmstead. Here new actors came on for an interlude, in the shape of the two Suffolk sires, and the cart-team, present and to come, among which the place of honour clearly belonged to a bay mare by Catlin's Duke, out of a Clydesdale mare (a combination which, to the disgust of the "pure Suffolk" men, generally comes bay), and a winner of first prizes at the Bath and West of England and Norwich. She unites very remarkable neatness and substance—so much so, that Sir Joseph Hawley has offered a long sum, in order to cross her with Musjid or Beadsman. Hitherto, she has had no such ambition, as the clever foal at her side was by Badham's Emperor, and Newcastle Captain claimed to be sire of mare No. 2. The van which was made at Stamford for £50, after her ladyship's plan, and contains standing-room for two cows and a calf in front, was drawn out, after its winter siesta in the barn, to receive its Dublin charges. John Ward seems to have taken his carpentering cue from the interior, as the whole of the first stable we entered was fitted up to correspond, with boxes for the calves in front of their nurses. Little *Victoria Regia*, by *British Prince* from *Victoria*, was making the most of her opportunities, and showing her neat little head to perfection in her efforts. Next her, and destined probably for the Show Yards, was *Lily Maiden*, from *Baroness*, very gay and clever, and with more substance than either *Victoria Regia* or *White Lady*, from *Lady Bird*, which had an eye as black as a Spanish maiden's. *British Prince*, *Sir Roger*, and *Valasco*, were all represented here; and in a dark corner, hardly well enough, after a recent calving, to give a reception, was the three-year-old *Hermione*, a daughter of *Majestic*. In fact, it was Booth here, Booth there, and Booth everywhere, inside; and we only got to the outside again to encounter *Lady Grandison* and *La Vallière*, two daughters of *Gainford 5th*, of "grand old Cherry blood." As yet, *Lady Grandison* (grand-daughter of the ancient Bonnet) has bred no Prince Talleyrand, like her half-sister; but in all the incidents of birth, there is a remarkable agreement in their horoscopes. Both are from Royal Buck cows, and both were bred by the late Mr. John Booth in October, 1855, and are in-calf to the same bull, although purchased from different persons. *Lady Grandison* is a lengthy cow, with a peculiarly rich, mossy coat, and handles delightfully. Her head is rather of the *Rose of Athelstane* type, but with the horns not quite so

far back, or springing so gracefully from the coronet. The other has not had such advantages of keep, but is hardy-looking, and with a neat fore-quarter. Prince Alfred's head, as curly as old Barley Sugar's, was next seen, slowly advancing out of his house; and then came "the great Albion rib" and the rare leg of beef, to complete the whole. The latter is an especial point with him, and it well earned him his right to have the royal patent so long.

A narrow path past the calf-houses and the end of the barn where "the prize-fighters" are kept, led us to the show ride, which is snugly sheltered on one side by a high paling, and on the other by the felt-covered bull-sheds, which have sliding sides, to put down in cold weather. *Heir o' Bulleighan*, by Sir James the Rose from Spicey, the subject, like his sire, of a Scottish ballad, was the first to turn out and show his good thick middle-piece on parade; and then came *Cherry Jacket*, by Sir Roger from Cherry Empress, and taking his name from her ladyship's pleasant recollections of the lucky colour on the Musjid Derby day. He is not so thick or so full of hair as his companion; while *Lord of Knowsley*, by Knight of Windsor from Stanley Rose, had hardly so good a head as he had every right to inherit, but nice hair and handling, and well sprung ribs. The white yearling *Brian Boru* was a luck-penny of a good massive coinage, with a rare loin and back, but perhaps, to some tastes, hardly masculine enough about the head. Keighley and Craven show-yards remember *Earl of Surrey*, by Windsor; and we remember him more especially for his peculiarly nicely turned hind-quarters and well-furnished leg of beef. To him succeeded a long array of heifers, the first two by Valasco, in which *Rosedale*, from Rosy, a neat calf, and all Booth, with the exception of the one cross of Master Belleville (a son of Belleville and Booth's Young Moss Rose); and the small-eyed *Madrid*, from Mistress Mary, had to yield to Charlotte's *Carlina*. The four Sir Rogers included *White Lilac*, from Lilac, very even and full of substance; *Empress of the East*, from Empress of Hindostan, a calf both in its good looks and sweet colour well worthy of a dam who could win fifteen prizes and five H.C.'s, in high company, before she was three years old; Lady Sarah's *Ladye Elinor*, neat in the head, and rather Hereford in its colour; and Princess of Saxe Weimar's *Princess Edward*, following Towneley's Victoria in the latter point, and lengthy and full of hair. *Victoria 35th*, an unseen purchase for 180 gs., from Mr. Ellison, of Loughglyn, then came out for a Dublin rehearsal. She was not placed in the calf class at the Royal last year; and, good as she is in her breast and carcase, there is a stumpiness about the head and neck, and a lack of character about the eye and horn, which sadly reduce her show-chances. *Ladye Ælfrida*, with the nice head and neat bone, came up with her, as another of the voyagers; and, beyond a tendency to be a little high behind, like her dam Lady Sarah, she passed muster well.

She is by Prince Alfred, and has the same rich hair and handling, which he so invariably confers on his stock. Then there was *Victoria 38th*, a heifer bought of Mr. Chandos Pole, which was only just out of the sick-list; and *Windsor Rosebud*, half-sister to Magnolia, a dark, rich roan, not remarkable for size, but with a good flank and twist. The setting-on of the head and neck and the fore-quarters of *Belle Etoile* well justified her ladyship's determination to have a slice of Wide Awake; and *Pride of Southwicke* had a pretty head, set off with a peculiarly prominent nostril. Her thighs are not so good, but her hind-quarters are better than Almack's Belle, who is rather vulgarized by large hips, although her crops far more than atone for them. The former calves in August, and it is not certain that she will go into the show-yards this summer, as far too much time has been lost, and she was only grazing in the Park last November. She is very evenly made, and girthed the same as "The Queen," to whom she was just a month senior, and would certainly have beaten her for size. Almack's Belle has unfortunately lost her Lord of the Valley calf.

Lastly, we had the three cows *Empress of Hindostan*, *Stanley Rose*, and *2nd Duchess of Glo'ster*, the winners of nearly forty prizes between them. Stanley Rose is a fine slashing cow, who fills the eye, and carries off her big frame and rather staring colour by a small and expressive head. The Duchess is very deep-fleshed, and, with the exception of a slight tendency to fall away near the top of her capital crops, and a slight patchiness near the tail, she is still a very taking cow in a show-yard. After all, there is a compactness and wealth about Empress of Hindostan, who gets a good point from her colour, which brought her up to either of them. All of them were regular breeders, and in-calf to Prince Alfred; and The Duchess well-nigh solved the problem of perpetual motion, as she calved *Ethelgiva* a few days after her Canterbury pilgrimage, and was winning the first prize at the Durham County within the week. Such a buxom trio have seldom stood together in one farm-stead, but it was for the last time, and when we met two of them in Ireland the next week, the little drama of Stanley Rose, the first scene of which, to our eye, was a bonny seventeen-month heifer, strutting out of her Aldborough box, to stand up before the "Nestor of Shorthorns," by the side of Moss and Ayrshire Rose, was fast drawing to a close. Some accident happened to the truck on which she rode, a short distance from Holyhead, and there was nothing for it but to take her out, and walk her through to the town, for a mile or more to the pier. The younger ones tripped it gaily enough over the stones; and Second Duchess of Glo'ster, as we have just shown, is like a piece of cast-iron; but the immense weight of Stanley Rose's top fairly crushed her, and it was piteous to see her hobble before the judges, to receive all the prizes she could win. Her feet were perpetually washed with lotion during the show week, but the fever set into them so fiercely when she reached home, that the strong remedies which

were used to save the hoofs drove the inflammation into her system. Although in very great pain, she was enabled to stand up on Friday fortnight, the day before she died; but the *post mortem* examination told too surely that one part had only been relieved at the expense of another. She was immensely thick-fleshed, but the internal fat was nothing to be compared to Queen of Athelstane's. And thus another name was added to that long sombre bed-roll of murdered beauties or park dummies, which ought to haunt the guilty path of every member of the Royal Agricultural Council on each Allhallows eve. To her ladyship, who had just refused

a very fine offer for her, coupled with The Duchess, the loss is a peculiarly heavy one, as "The Rose" was her especial favourite, and none came so readily and affectionately to her call. Still few owners can bear losses with more unflinching patience, and the two beautiful roans of Branches will not have died in vain, if they secure to its calves and yearlings a monopoly of "training" for the future. There is no reason why Time should not turn up trumps in a herd so highly bred, and bestow many a winning rosette in those Royal fields, to which Glen Lonan's chief was such a dashing pioneer.

H. H. D.

NOTES ON THE ARRANGEMENT OF FARM BUILDINGS.

It doubtless appears to many an easy thing to design a "farmery;" at least we may judge so from the multiplicity of the plans so-called "model," which have been published from time to time. From many of these it is easy to see, that in the opinion of the designers, all that was necessary to know was a series of names of apartments, such as barn, granary, implement-house, stable, cow-house, and the like; and all that was necessary to do was to put these into a species of designing pepper-box, so to speak, and to dust them over a sheet of drawing-paper, taking care to arrange them in somewhat like symmetrical order, so that their outline would give in elevation, a decently fair architectural *coup d'œil*. That something like this process has been carried out by some is evident enough, for from the incongruous intermixture of apartments, it has not apparently been considered by the designer whether there was a necessity for having all those which they so ingeniously crowded into these designs. It has never struck many of them apparently, that some of the apartments were not at all required in the processes of a certain kind of farming; that in point of fact, they were as much out of place for certain purposes as a cotton carding-room would be in a worsted or a silk factory. The fact to many of them being apparently unknown, that as there are different styles of manufacture, so there are different styles of farming, and that the latter require manufacturing premises, as it were, designed in accordance with their manufacturing peculiarities, just as carefully as do the former.

To design a farmery, two things are essential to be borne in mind, namely, a thorough acquaintance with the peculiar requirements of the farming carried on, for which the "farmery" is required; and, secondly, a knowledge of the "order," or sequence with which these requirements succeed each other. These essentials are, in point of fact, common-place enough; but, like many other common-place things, they are very apt to be overlooked. The simplicity of a thing is not always a passport to its ready reception.

A knowledge of the first essential named above will obviously lead to *economy of construction*; for where it is attended to, there will be no unnecessary apartments

set down in the plan—apartments required, doubtless, in some building, but which are not desiderated in the case which may be in hand. On the other hand, a knowledge of the second essential, named above, will conduce to *economy of labour*, for the apartments required will be arranged in connection with one another in such a way that the "material" shall go regularly through its various stages, each stage having its own apartment or compartment, from the first to the last, all going from one point to another, and in consequence all unnecessary labour being avoided.

Some of the incongruities which are easily ascertainable in many published plans might, and likely would have been avoided, had their authors studied with care the opinions of our various agricultural authorities on the subject of farm buildings. These, doubtless, are scattered through many works not easily available, so much so, indeed, that we have deemed it likely to be useful to many of our readers to present them with a brief *resumé* of what has been said, and how said by the majority of our authorities on this important point.

In commencing to lay out a "Farmery" the first point to be considered is its *site*. On this point our various authorities have delivered their opinions. Mr. Stephens, author of the "Book of the Farm," the Nestor of our agricultural literature, has the following: "It is a necessary condition to its proper use, that every steading be *conveniently* placed on the farm. To be *most* conveniently placed in theory, it should stand in its *centre*; for it can be proved in geometry that of any point within the area of a circle, the centre is the nearest to every point in the circumference. In practice, however, circumstances greatly modify this theoretical principle. For example: if an abundant supply of water can be easily obtained for the moving power of the thrashing-machine, the steading may be placed for the sake of economising horse-labour in a more remote and hollow spot than it should be in other circumstances. For the purpose of conveying the manure down-hill to most of the fields, some think the *highest* ground near the centre of the farm is the best site for the steading. Others prefer the *lowest* point near the centre, because the grain and green crops being

then carried down-hill to the steading, the labour would be less than carrying them up-hill, and they are heavier than the grain crops and manure. In selecting either of these sites it seems to be forgotten that loads have to be carried both *to* and *from* the steading, so that either position will answer provided there be no steep ascent to, or descent from the steading. The lower situation is, however, the most consonant with experience and reason than the higher, though level ground affords the easiest transit to wheel-carriages. It is desirable for the farm-house to be situated so as to command a view of every or most of the fields on the farm, that the farmer may have constantly a bird's-eye view of them, and if circumstances permit, especially a plentiful supply of good water. The vicinity of the house should be the site for the steading, but if a sacrifice of the position of either is necessary, the farm-house should give way to the steading."—*Book of the Farm*, vol. ii., p.p. 518-19. Blackwood and Sons, Edinburgh and London.

Other authors bear on this opinion of Mr. Stephens as to position: thus Mr. Andrews, in vol. i. of his "Rudimentary Treatise on Agricultural Engineering Buildings," pp. 9 and 10 (John Weale, and Messrs. Lockwood, London), has the following: "The choosing of the site upon which to build the steading is a very important matter, and requires much more consideration than would at first appear, for if it has been judiciously chosen, a vast annual amount of labour may probably be saved."

Theory would at once point out the centre of the farm as the spot best suited, but the locality (in nearly all cases) will afford some peculiar advantage that will settle the question. For instance, if water-power can possibly be obtained, either from the natural fall of any river, or from the penning up of any little brook, or from the drainage of the land (as has been done in some cases), then it ought to decide the position of the steading at once; as there is scarcely any advantage that can equal a motive-power from a fall of water; not that an inconvenient spot in other respects should be fixed upon merely because that fall happens to be there, as there are many simple contrivances of engineering for carrying the fall of water to the mill, if it is inconvenient to take the mill to the water.

Facility of access to a turnpike-road, or proximity to a railway-station, or canal-wharf, or the opportunity to discharge the liquid-manure from the tanks to some distant spot on the farm by its own-gravity, and to avoid the great labour of pumping—all these and others are circumstances that will affect the choosing of a site.

But there are certain desiderata that must be sought and had under all circumstances, such as a tolerably level piece of ground, or one gently sloping towards the south: this must be perfectly dry or artificially made so. Proximity to marshes, ponds of stagnant water, or sluggish rivers should be avoided, and a plentiful supply of good water must be at hand, and the means exist for procuring an efficient drainage of all the water from above or from the adjacent land."

Again, on this point Mr. Loudon, in his "Encyclopædia of Agriculture" (Longman and Co., London), has the following: "The situation of every farmery ought, as far as practicable, to be in the centre of the farm, because this will reduce the labour of carting home produce, and carting out manure to a minimum. When the surface of a farm is very irregular, or where it consists of the sloping side of a hill; the side of the farmery should be chosen at that point of height in the slope where extra labour of carrying home the crop will always be balanced by the extra facility of carting out the manure, and where as much as possible the labour of the two operations may be equalized. The most difficult course for choosing a proper site for the farmery is where the lands lie on the two sides of a valley; here is no choice but that of placing the farmery in the valley, and laying out the fences, roads, and low ridges of the field in directions athwart the slopes; so as to diminish all the farm labour to the extent of one-half what they would be by ascending and descending in straight lines."

With reference to placing the steading not on the highest part of the farm, Mr. Ewart states that one important advantage is gained by it, namely, "the drainage-water of higher ground being collected at a proper elevation, in an underground reservoir, will rise by its own pressure to a height sufficient for filling boilers, or for any other purpose so essentially necessary, which may be required on any part of the farmery, and a supply can thus be obtained at all times without being raised by pumping or any other means by which expense may be incurred."—Mr. Ewart's "Essay on the Construction of Farm Buildings," "Journal of the Royal Agricultural Society of England," vol. xi., p. 216.

Another point to take into consideration while determining the *site*, is the nature of the soil. "The best soil," says Mr. Newland, a high authority on such matters, "on which to erect buildings, is that which is in itself the driest; and the worst is such as is most retentive of moisture. Gravel and clay are the two extremes, and a soil is well adapted for building on, in reference to health, precisely as it recedes from the latter extreme. It is remarked by Mr. Loudon that those soils are the healthiest which are superimposed on sandstone and calcareous rock: those based on chalk are less healthy, and the worst are such as lie on argillaceous bottoms; but even the worst soils may be improved, the great improver being drainage."—See article in Morton's "Cyclopædia of Agriculture, on Farm Buildings," vol. i., p. 787.

Low-lying marshy places should be carefully avoided as the site of the farmery. Roads should be made to suit the buildings, rather than the building to suit the roads, as is too often and absurdly done. In determining the site, however, a variety of circumstances will likely present themselves to the architect, greatly modifying or tending to modify the arrangements which correct theory seems to indicate. In all cases, therefore, he will have to consider well all the circumstances presented to his notice, endeavouring to obtain the maximum of advantages.

Having decided the question of *site*, the next point to be attended to is the *position or aspect* of the building. All agree that the building should stand in a south-east direction. This, as Mr. Newland remarks, is that which in general in this country "secures the advantage of sunny warmth, light, air, cheerfulness, and shelter from high winds and driving rains." * * In regard to aspect, it may be observed that in every district there is a certain point, from which, owing to local peculiarities, storms are more frequent than from any other. This once ascertained, the rule should evidently be, to choose such an aspect as will afford the best shelter under the circumstances."

We now come to consider the most important point connected with a farm steading, or farmery, namely, the *apartments required* in it, and the method in which they are placed in relation one to another. Deciding as to the apartments required in the steading would seem at first sight to be a very easy matter, and so it is in reality; yet with some it has not been so, if we may judge from many of the "model steadings" which have been issued from time to time, on which a variety of apartments have been placed together, without any consideration having been bestowed as to whether they were required or not. Thus, it is quite obvious that where dairy farming is carried on, the apartments necessary will not be the same as those in a farm where the raising of grain is the principal work of the farm. "It may, as we have elsewhere remarked, "perhaps be to some of our readers a novel statement, that there are several kinds or modes of farming practised throughout the kingdom. The term farming in its usually received acceptation is a very limited one, conveying as it does the idea that its principles and practice are the same everywhere. Thus to the popular mind farming in one district or locality is the same kind of business, and distinguished by the same peculiarities of practice, as farming in another. There are, doubtless, in the several modes or systems of farming practised in Great Britain, many peculiarities common to all; but some possess points not at all desirable in, or applicable to others." Hence, a great number of modes of farming have an existence amongst us, all severally distinguished by peculiarities, and requiring aid only applicable to each particular one. Strict attention, therefore, is obviously necessary on the part of the designer of the farm steading as to the peculiar kind of farming carried on by his client, and the consequent requirements of the steading, which he is in need of; so that no superfluous apartment be given to the exclusion, perhaps, of one imperatively required. Having thus decided on the number and kind of apartments required in the steading, the next matter to be considered is their *arrangement*, so that the process carried on in one apartment shall aid that carried on in another and contiguous one; that in short, economy of time and labour may result from the way in which the various portions of the building are placed in reference one to another.

Where such a number of modes of farming exist, it is reasonable to suppose that a like variety of arrange-

ment of the steading will exist also. Although this is to a certain extent true, still it will be found, that there is a principle of arrangement, which is applicable alike to all farmeries. This principle it was reserved for Mr. Stephens to explain and elucidate in his *Book of the Farm*, vol. ii., pp. 519-520. So philosophical, and at the same time practical is it, that nearly all writers on the subject have agreed to recommend its adoption, or at least quote it with approbation; while others, who do not so obviously refer to it, give in explanation of their principles of arrangement, demonstration, and arguments, which if not founded upon Mr. Stephens's principle, display at all events a somewhat striking resemblance to it. The truth, perhaps, is that the principle is so distinguished by its common sense attributes, that it has had for a long time a place in many minds, Mr. Stephens being first fortunate enough to give its immediate enunciation a place in recorded literature, and that in terms so remarkable for its force, yet plainness of statement. It is but right to state that the principle is propounded in connection with the management of a farmery for "mixed husbandry," or "mixed tillage," as it is sometimes termed. This mode of farming is what we may term an epitome of all others; it possesses the attributes of a dairy farm, for milk cows are kept, and butter and cheese made; it possesses also those of a stock farm, for cattle and sheep are reared and fattened for sale; grain is also grown. Adapting itself to nearly all localities, and requiring exercise of thoughtful vigilance and cautious care; and the command moreover of considerable capital, it must be carried out in large farms, the minimum being 500 acres. The mixed husbandry system is, perhaps, the most favoured in the estimation of scientific agriculturists. The following is Mr. Stephens's enunciation of his principle of arrangement.

"Straw being the bulkiest article on the farm, and in daily use by every kind of live-stock, and although heavy and unwieldy, having to be carried and distributed in small quantities by bodily labour, it should be centrally placed in regard to the stock, and at a short distance from their respective apartments. The *straw-barn*, its receptacle, should thus occupy the central point of the steading. The several apartments containing the live stock should be placed, in respect of distance to it, according to the wants of the stock for straw, in order to save labour in its carriage; for so bulky and heavy an article as straw should, in all cases, be moved to short distances, and not at all from any other apartment than the straw-barn, so that the thrashing-machine which deprives the straw of its grain should be so placed as at once to deposit the straw into the straw-barn. The stack-yard containing the unthrashed straw, with its corn, should be contiguous to the thrashing-machine. The passage of the straw from the stack-yard to the straw-barn through the thrashing-machine being directly progressive, it is a material consideration in the saving of time to place the stack-yard, thrashing-machine, and straw-barn in a right line.

"Different classes of stock require different quantities of straw to maintain them in the same degree of

cleanliness and condition, so that *those classes* which require the *most* should be placed *nearest* the *straw-barn*. The younger stock, including those in the hammels, requiring most straw, receiving it largely for fodder as well as litter; the courts which they occupy should be placed contiguous to the straw-barn, one occupying each side of it. The older or fattening cattle requiring the next largest quantity of straw, the hammels which they occupy should be placed next to the courts in nearness to the straw-barn. Horses and cows requiring the smallest quantity of straw, the stables and byres may be placed next furthest in distance to the hammels from the straw-barn.

"The position of the other two apartments are necessarily determined by that of the thrashing-machine, the one being the upper barn, which contains the unthrashed corn from the stack-yard ready to be passed through the mill, and the other the corn-barn, which receives the corn immediately after its separation from the straw by the mill. The granaries should be in direct communication with the corn-barn, to save the labour of carrying the clean corn to a distance. * * The granaries should always be elevated above the ground, to keep the grain in good condition, and it enables their floors to form convenient roofs for cattle or cart-sheds. The elevation which the granaries give to the building should be taken advantage of, to place them so as to shelter the cattle courts from the north wind in winter, and in order to afford the warmth of the sun to the cattle all their courts should be open to its light and heat. The courts being open to the south, and the granaries forming a screen from the north, it follows that the granaries should extend east and west on the north side of the courts, and as it has been shown that the cattle courts should be placed on each side of the straw-barn, it also follows that the straw-barn, to be out of the way of screening the sun from the courts, should stand north and south, at right angles to the south of the granaries. The fixing of the straw-barn to the south of the granaries, and of course to that of the thrashing-machine, the position of the stack-yard is necessarily fixed to the north of both, where it is favourably situated for the preservation of the corn in the stacks.

"The leading principle involved in the above arrangement is as comprehensive as simple, and is applicable to every size and kind of steading. But obviously correct as the principle is, it is seldom adopted in practice; and I may safely assert that the greater the deviation from the principle, the less desirable steadings become as habitations for live stock in winter."

On this point of "arrangement" of the apartments in a farmery, Mr Newlands, author of the able article on "Farm Buildings," in John Chalmers Morton's *Cyclopædia of Agriculture*, and a reliable authority on such matters, has the following: "The leading object to be arrived at, in the arrangement of the plan, is economy of time and labour in the performance of the work to be carried on. In following this object there are two important principles which should guide the designer: the first, that there should be an immediate connexion between those buildings or apartments where

usefulness depends upon each other; the second, that houses used for analogous purposes should, as much as possible, be classified and arranged together. In carrying out the first of these, we shall find that the position of the barn governs that of the other buildings or apartments. For the straw-barn being the great store-house of fodder and litter, from which the stables, feeding sheds, and yards receive their supply, it is necessary that these be situated as near to it as possible, and those the nearest to which the greatest and most frequent supplies have to be conveyed. Again, the straw-barn is an appendage to the barn where the corn is thrashed: there is a necessary connexion here also. To the corn-barn must be attached the building which contains the motive-power to drive its machinery; and it is a convenient arrangement to have the granary in immediate connexion with the corn and dressing-barn. Further, the house where the food is consumed should be in connexion with, or at least not far removed from, the house in which it is prepared; and this, again, should be contiguous to the places where the food is stored. Lastly, that the cleaning-out of the houses may not consume unnecessary time, the place where the manure is deposited should be near to them and of ready access."

"It should always be borne in mind that it is more important to save time in comparatively insignificant operations of frequent occurrence, than in larger matters which are not often repeated. Thus it is better to have the house, where food is prepared, and whence small quantities are taken several times each day, close to the place where food is consumed, than to have it near the store-house, from which the supply may be required to be carried only once.

"The second principle of arrangement, though subordinate, is yet of great importance; it is to classify and arrange the buildings or apartments used for like purposes. Attention to this greatly facilitates the labour of the homestead. Thus the homes and yards for particular descriptions of stock should be placed together; the working cattle should be kept by themselves; the cows of the domestic dairy should be kept apart from the feeding stock; pigs and the poultry should have each their proper locality. It is of great assistance to this classified arrangement to have a working court or yard, round which are assembled in their proper order the apartments for storing and preparing food, the sheds where the wheel-carriages of the farm are stored, the houses where the tools and the smaller implements are kept, those in which the blacksmith and carpenter work, and the others used occasionally for various purposes. And in addition to this, it is important to place the highest buildings so as to afford shelter from the prevailing winds, and yet not to intercept the rays of the sun from the other buildings and the yards. In many situations it is desirable that the whole of the outhouses should be so arranged as to have one common entrance, which can be closed for security every night." — "*Cyclopædia of Agriculture*," vol. i. p. 789.

A vast amount of practical information as to the arrangement and construction of "farm buildings" was

given in the XIth volume of the "Journal of the Royal Agricultural Society," in explaining and illustrating the various essays which were sent in to compete for the prize offered by the Society for the best plan. The essays were preceded by a letter from Mr. Thompson

to Mr. Pusey, then editor of the "Journal," in which were given a few practical hints which cannot fail to be useful to those consulting them. Space forbids us giving them *in extenso*; but in returning to the subject we may possibly give a brief abstract of them. M.

ON THE RE-FORMATION AND RE-CONSTRUCTION OF FENCES ON THE TILLAGE FARM.

THE VIOLATION OF THE LAWS OF VEGETATIVE NATURE, ESPECIALLY AS RESPECTS TILLAGE CROPS, CAUSED BY OVER-GROWN AND OVER-CROWDED HEDGE-ROWS; AND THE PRINCIPLES, PHYSIOLOGICAL AND TECHNICAL, TO BE OBSERVED IN THE CONSTRUCTION OF LIVE-FENCES EPITOMIZED.

It may seem incredible, yet undoubtedly it is true, that a very considerable proportion of the existing fences of England date back, in point of laying-out and construction, to the earliest eras of her agriculture. Nay, more—those who have sought to discover the motives which induced our rural forefathers to adopt such wonderfully devious field-boundaries, have, with one assent, referred them to the original enclosing of the space from the then exposed waste—the bend outwards embracing the adjacent good soil and the inward one excluding inferior spots. In those primitive days the spade and mattock prevailed much more as implements of field-labour than now; and hence, irregularity of outline in the then tillage enclosure was attended with comparatively little cultural inconvenience.

Again, at the early period at which we are glancing back, and for many centuries after, the succour of shelter to cattle was pre-eminently desirable; because, unprovided as the husbandman was with that abundance of succulent provender in winter which the roots of modern agriculture afford, he had no choice but to leave his beasts in the pasture field or meadow at all seasons. Hence, for their better protection from the winter blasts, the farmer of former days was excusable in giving full licence of growth to the plants constituting the boundaries around his closes. In this manner it originated, and at first and for long without any violation of convenience or economy, that hedges became the informal and over-grown and over-crowded feature in the landscape which, even till now, has unfortunately been perpetuated in a great majority of the counties of England, in the face of the strongest objections of modern husbandry to their continuance. Assert at any market-table that most of the gentlemen present habitually pursued methods of farming inherited by them without improvement since the days of their grandfathers, what lively disclamations would the allegation elicit! Yet, probably, not one present should be able to claim for his holding a single fence which, in point of date, was not centuries old, and in point of laying-out and construction did not more or less impede all the most improved tillage expedients of the last fifty years. In our former two papers we have shown the great hindrance to the thrifty execution of the prime opera-

tions of cultivation occasioned by mis-shapen and undersized arable fields; and reminding the reader, that shelter to live stock on the corn farm has come in these latter days to be of much less consequence than of old, let us present an epitome of the physical consequences inimical to the physiological well-being of growing crops pent up within lofty hedges surrounding diminutive fields.

1. The quantity of aliment abstracted from the soil by the roots of every species of plant is proportionate to the development of the parts. A timber tree, like the oak or pine, will draw off much more than the hawthorn or hazel bush, and an un-trimmed quick-set, growing to its full size, more than one pruned down to four or five feet in height. "Look at those thieves," said a Devonshire farmer to the *Times* Commissioner, pointing to three stately elms growing in the hedge of a turnip field: "I warrant there is not a root as large as an apple within many yards of them." On measuring the ground, they found that for *forty* feet out into the field from the hedgerow opposite those three elm trees, the crop was quite diminutive, while immediately beyond their influence the size of the turnips was quadrupled. To maintain unnecessary ranks of overgrown and antiquated live fences is no less irrational in the farmer, in a sumptuary point of view, than in the squire to feed and lodge a troop of idle and pilfering servants, simply because it had always been the fashion at the hall to maintain a large body of retainers. The harbourage which ill-conditioned and unnecessary fences give to four-footed vermin and destructive birds and insects as well as to weeds of the worst kind, forms another palpable reason for their extermination.

2. An early seed-time is generally the forerunner of a seasonable and plentiful harvest; and since the proper conjuncture for the process of sowing entirely depends on the dry condition of the soil, how can a small field screened from the passing winds by high hedges throw off by evaporation its superfluous moisture? So in like manner of all the operations of tillage, whether preceding or following seed-time. To work the land whilst it is wet, is simply suicidal; but to wait till a field, in the condition we are here speaking of, shall become dry, is to run the risk of a fresh rainfall. Even in feeding off turnips great inconvenience and loss may accrue to the farmer from the continued wet state of the land occasioned by over-shelter.

3. On a general average at least nine-tenths of the dry matter of all plants is composed of elements ob-

tained from the atmosphere, either directly through the functions of the leaves, or indirectly through the medium of the soil and roots; and without a correspondingly abundant and continuous fresh supply of aerial food they cannot prosper. To furnish this supply is one of the many-appointed offices of the ever-shifting winds which sweep along the ground; hence, the more thorough the shelter the greater the accumulation of exhausted, and hence vitiated, air around the plants, and the less the accession of fresh supplies. Again, physiology has demonstrated that a chief function of plants is to absorb moisture from the soil by means of their radical fibres, and to transmit it through stem and branches to the leaves, to be there thrown off by evaporation. But this action is greatly controlled by the dry or moist condition of the surrounding atmosphere. In dry air the function proceeds with healthful energy; but if the surrounding medium be loaded with vapour, as is constantly the case in stagnant air, such as will inevitably accumulate between lofty hedgerows, it will be feeble and morbid. Hence it is that that state of watery succulence, natural to the plant in its earlier stages of growth, is prolonged in over-sheltered, and therefore over-moist situations, into the period when rather it should be desiccating itself into ripeness; while, on the other hand, a free exposure to every wind that blows is the best and only means to promote atmospheric dryness, and thus early and thorough maturity. Nay, more: it has been proved beyond question that the waving motion imparted to vegetation by the passing breeze is mechanically favourable to the healthy circulation of the alimentary juices in all plants.

And lastly, in that crowning period of the agricultural year, the corn harvest, what is the picture too frequently presented within the precincts of the over-fenced and under-sized inclosure? We will here exhibit a sketch from the graphic pen of one of the ablest of English writers in practical husbandry. "The corn of narrow close fields," says Marshall, in his most instructive work entitled "*Minutes of Agriculture in Southern Counties*," "and everywhere under high trees, is, by the many heavy rains, very much lodged, and in some places grown through by weeds; while in large open fields, or where the hedges are low, very little damage is done. But at present I feel their inconvenience still more sensibly. We carried the *middle* of H. 1 (wheat) the day before yesterday (August 15) in good order; but about a load under a high quick hedge was still damp, and was obliged to be left in the field yesterday. Some of the sheaves were opened to give them air; a heavy squall came on before they could be reset up, and they are now growing into mats as they lie on the ground. Had it not been for the *high* hedge it would have been all safe in the barn. I would not wish to see the fence of an arable field above four feet high. The oats of A., under a high thick hedge, are mere dung; under one which was cut down last year to about four feet they are very little the worse for the weather."—Vol. i, p. 332.

From the physiological and practical ill-consequences of over-grown and over-crowded hedge-rows let us now

pass to the consideration of the physiological principles involved in the successful growth and treatment of fences themselves. Now, it were simply to express a mere truism were we only to remark that in old hedges it is constantly happening that individual plants, at various points along the line, are dying out, and thus the unthrifty services of the gap-stopper are in continual requisition. To attribute this circumstance to old age does by no means account for it, because even where a set of vigorous young seedlings are transplanted from the nursery, and placed in the vacant spaces, they also most commonly decay, and ultimately die out. How is this? We reply, that in the case of the young, as well as of the old plants, there is presented an exemplification of that general law of nature which exhibits itself in what is called land sickness, and which not only affects the plants of cultivation, but attacks the sturdiest forms in their natural habitations, and converts the once dense forest into a bleak and treeless moor. By extirpating these effete and every-way unthrifty divisions, and resorting to new lines of inclosure, the agriculturist may not only bring the subdivisions of the farm into proper size and form, as respects economy of cultivation and the well-being of his crops, but will free himself from the bootless labour and cost of trying to keep up fences on which the laws of nature have passed the doom of inevitable decay.

Proceeding with our argument, we shall next suppose that, moved by considerations such as have been urged in this and former papers, a new suit of fences has been designed and staked off on the ground; and now the question comes to be, by what principles, physical and physiological, shall the process of construction be guided? In the first place, then, the planter must remember that every species of vegetable, to whatsoever industrial purpose applied in its growth, affects a quality or condition of soil proper to itself. In their normal habits the thorn and bush, for instance, prefer a dry soil, and will decay and die out in a wet one; and, therefore, he who plants either in ground not naturally dry, or from which the superabundant moisture has not been withdrawn by thorough drainage, will never procure a thriving or lasting hedge. To dry a wet soil intended to be planted with quick, the futile expedient of excavating an open ditch on either or both sides of the line is very usually resorted to, in neglect of the fact that the roots, in their efforts to obtain food, will descend beneath the bottom of the cut, and re-ascend to the vegetable mould on the opposite side, super-saturated, as is here supposed, with unwholesome moisture; and thus, by no expedient can the ill effects of wetness in the soil be withdrawn from the hedgerows but by the same means which are requisite for the prosperous growth of the corn or other cultivated crops. It no doubt is very true that to pass lines of pipes underneath, or in immediate proximity along a planted fence, would be a great practical blunder, since inevitably the descending roots would speedily insinuate themselves through the joints of pipe-drainage, and multiplying themselves into innumerable threads, choke the passage of the water. But the desired effect may effectually be achieved by

running a spur drain parallel to and on each side of the division; or if the lie of the ground does not admit of that method, by bringing the ends of the drains distributed generally through the field into moderate proximity. But in either plan an intervening distance must be observed, sufficient to render it impossible for the root fibres to reach and invade the pipes.

But there is still another preliminary step, which to omit is extremely impolitic, except where the circumstances of the soil are particularly favourable to the rapid growth of plants of the tree kind, namely, that of trenching the land in which the young plants are to be set. Nowhere should the breadth be less than three feet; in poor soils it ought not to be less than five. Thus encouraged, the hedge will sooner arrive at maturity, by several years, and thus the yearly outlay and labour expended in protecting it whilst unable to protect itself will be proportionally lessened. Nay, further, to promote this desirable object, many judicious planters apply at the outset a moderate quantity of manure, and, from time to time, repeat this encouragement, should symptoms of languishing growth present themselves. With regard to the selection of plants, let no false economy lead to the use of those of less age than five years, or which have not undergone the process of transplanting in the nursery. By all authorities the season most proper for putting in is held to be that which intervenes between the fall of the leaf and mid-winter. All this done, then may the planter reasonably hope to possess in after years the comfort and advantage of an efficient fence—provided (and alas! the proviso is a large one) that he pales it off from the inroad of beasts, keeps in some suitable dépôt a ready supply of supernumerary plants to replace the ravages committed by hares and rabbits in severe winters, and takes order for periodical hoeing, spudding, and weeding with all the precision and care of garden cultivation. Let no man, therefore, propose to himself the throwing down of existing hedge-rows with a view to the construction of new lines, who cannot rely on himself to carry out for several successive years a system of culture in this operation as exact and seasonable as that which he bestows on his shubberies, or the bushes of his kitchen garden.

As regards the pruning of hedges, there has been much diversity of opinion. By some, the free use of the shears and bill-hook yearly, from infancy to full-growth, has been confidently advocated. With physiological principle this practice is altogether irreconcilable; and, accordingly, the best authorities now teach, that the plants should be allowed to grow in their natural forms, with no interference by pruning except to the extent of removing any branches offering to grow in perverse or unsymmetrical forms; and on no account ought the stem or leading shoot to be touched till the desired height of the fence be attained. Under this treatment an untidy and seemingly neglected growth will no doubt be exhibited; but thereby will a vigorous vegetative energy be kept up, and when the proper time of

pruning has at last arrived, the functions of the plants will have acquired a strength capable of sustaining without injury the shock of the operation. But even at maturity this is a process which may very easily be overdone. "In many localities," said that eminently practical as well as scientific agriculturist, Mr. Owen Wallis, of Overton Grange, Northamptonshire, addressing the London Farmers' Club, "the hedges have been so weakened by annual cuttings, that they are no longer of use as fences against cattle and horses. With regard to this practice of cutting the hedges, I am decidedly of opinion that it must be discontinued, or there will not be a fence in the country that will even stop a sheep. To old hedges it is utter ruin, and it will very soon so weaken the young fences, as to make them little better than old ones. I have, therefore, ceased on my own farm to cut them annually; nor do I think I shall soon be induced to resume the practice. I am aware that I have done so at the expense of that appearance of neatness and order, that nicely trimmed fences impart to a farm, and at risk of being considered an untidy fellow by those who do not know my reasons for the change. There is no occasion, however, to allow hedges to grow to the size they did in former times; neither is there any necessity for wide open ditches by the side of them." Mr. Wallis then proceeded to recommend that a periodical trimming, once in each course of cropping, ought, nevertheless, to be resorted to; but with this limitation, that only one side should be done in one season. By this means the untrimmed branches and sprays on the untouched side are left to carry on the functions of the plant in adequate vigour under the infliction to which it has been subjected at the other; and by the time the next round of cropping arrives, the shorn side will have acquired full physical strength to resist trespass, and functional energy sufficient to withstand the shock of the shears and hedge-bill, on the other.

As to the season for pruning, early Spring or latter Autumn is the best; and the latter Spring or early Autumn the worst, the juices of the plant being then in the state of greatest activity, and therefore in the aptest state to bleed to a fatal extent at the many extremities of the wounded twigs.

But under the best care, the management of hedge-rows is an irksome and expensive, and not unfrequently an unsuccessful task, and fully justifies the axiom that the fewer their number the less the trials of the farmer's temper and patience. Surely, then, it is comfortable to think, that whether he be resolved to abide by animal strength as his motive power in field cultivation, or to take to his aid the mighty agency of steam for this purpose, increased magnitude in his inclosures are in either case alike economically advantageous; nay, more—this agricultural reformation would be thrice blessed, since the same re-arrangement which promotes economy in tillage procedure, enhances the fertility of the crops, and diminishes the cost of maintaining the farm in a thoroughly fenced condition.

THE DEVELOPMENT OF STEAM CULTURE.

Five-and-twenty years ago Clarke Hillyard wrote in his *Practical Farming*, "I have long been convinced that a steam-plough might be constructed to plough a dozen furrows at once, I hear that one is likely soon to be brought forward, and I should think it would well answer on the large open arable farms in Hampshire, and other counties." Little, however, when he said this, could our author have thought the prodigious amount of experimenting and squandering of money, and public contests, and endless controversy and reporting in the papers, that would be necessary before such a machine could be introduced. Indeed, nobody has yet ventured upon "a dozen furrows" at once, excepting our go-ahead cousins in the States, who seem well up to the mark in preparing flaming reports of performances. That is, if we may judge from the accounts of their traction-engine, which, with steam at a fearful pressure, makes one dash along the prairie sward, and for a little while turns over nobody knows how many furrows at once, at, of course, an unmentionable depth, and the slices of such a breadth that the work probably resembled the rooting of long-snouted Illinois swine in search of corn-cobs ingeniously buried as an incitement to the labour. Whereupon it was published that our English mechanicians were beaten hollow as to quantity of work per day and cost per acre.

Neither could Mr. Hillyard foresee that when the steam-plough became a really practical engine—as it may now be pronounced to be—how another of his observations would be interpreted. He wrote: "I strongly recommend all those who enter into farming, either for employment, amusement, or to reclaim land that has been injured by a bad tenant, under no consideration whatever to attempt the cultivation of a poor clay soil, where the tillage is laborious and the produce of the land always small. The labour in cultivating a poor soil is not great, and therefore it may be improved without ruinous expense. I know of no employment so wretched, at this time of low prices, as the cultivation of a poor clay soil; a decent livelihood cannot be obtained by the most industrious and best manager; by the sweat of his brow a truly hard-working man may get a bare subsistence, but nothing more." This is as true of poor clay occupation now as it was in 1836, in spite of the growth of artificial manuring, which has become a most expensive resort of the impoverished farmer. But we are privileged to behold the means of relief and timely succour, and ultimately of profit and amelioration, as perhaps unexampled in our past agricultural history. Steam-culture is a fact; and the time of the clays has clearly arrived. In a poor sand you may often sink hundreds after hundreds of pounds in artificial and natural manuring, and still find the soil too weak to bear crops capable of

repaying the outlay. "Poor clays," on the other hand, are often of bad character, owing merely to the want of good tillage and drainage, and under adequate mechanical arrangement will produce any amount and weight of cropping. So that the opinion of the agricultural author we have quoted may not hold good in reference to the unprofitableness of such clays, now that the steam cultivator or plough has placed a new power in our hand.

The experience of Mr. Edward Holland, M.P., of Dumbleton Hall, Evesham (the new Member of Council, as given in the last part of the Society's *Journal*), enables us to estimate pretty clearly the advantage to be derived on stiff land by adopting the steam plough. First, as to saving in the annual cost of tillage. The daily working expenses of the 12-horse-power steam-plough are—for labour, 11s. 9d.; horse, with water-cart, 3s.; half-a-ton of coals, 7s.; oil, 1s.; making altogether £1 2s. 2d. The estimate adopted by Mr. Holland, after a lengthened experience, for the items of repairs, depreciation, and interest upon first cost of the engine, machinery, rope, and implement, amounts to about £1 10s. per day; this depending on the number of days worked in a year. The area of arable land is scarcely 400 acres; the amount of steam-cultivation that can be beneficially applied to it being thus reckoned by the manager in the four-course system:—

	Acres.	Days.
For wheat (one ploughing)	100	in 20
For roots (ditto in Autumn).....	100	in 20
Spring cultivation, land (scuffled twice) {	100	in 10
Extra work, foul land (scuffled once) ...	100	in 10
For barley (one ploughing)	100	in 20
	600	in 90

The time stated is inclusive of removal.

The cost of labour and wear, &c., being £2 12s. 9d. per day, the total yearly outlay for steam culture is, therefore, £337 7s. 6d. Mr. Holland states that the steam-plough has displaced 10 of his working horses; and as he formerly kept 20, his stable expenditure is reduced by one-half. His experience is that a working horse cannot be kept at a less cost than £30 a year. The average cost of food and extras, including blacksmiths', saddlers', and farriers' bills, and the cost of maintaining the value of the team undepreciated, given by Mr. Morton, from twenty-one cases, is £28 10s. per horse. But great differences being made by the style of keeping adopted, we take Mr. Holland's own valuation of £30, that is £300 for the 10 horses. To this must be added the proportion of the wages of team-men, and of the annual wear of implements, due to these horses; this is estimated by Mr. Morton (from the same twenty-one cases) at

£17 10s. per horse, or £175 for the ten. Hence, the dispensing with ten horses saves £475 a year. But these horses are not simply no further object of expense; they have been turned into money, which must be reckoned as yielding henceforth its 5 per cent. interest to the farmer. Mr. Holland stated in a speech, some time ago, that eight horses sold, realized £300; so that the ten we may take as sold for £375; and the interest upon this sum is £18 15s. per annum. The case, then stands thus—Mr. Holland pays yearly £237 7s. 6d. for steam tillage, and receives back (or keeps in his pocket) every year £493 15s., which would have been otherwise incurred in horse-labour. Deducting one amount from the other, it appears that a direct gain of £256 7s. 6d. per annum is obtained by the mere substitution of steam for half of the former animal power, on rather less than 400 acres: this is at the rate of 13s. an acre.

So far, then, we find a considerable profit from adopting the steam plough—deduced from Mr. Holland's own figures, after he has had a sufficiently lengthened experience to warrant his statements of expenditure and work done. If we stopped here we should have shown ample cause why steam culture should be introduced upon all strong-land farms of three or four hundred acres extent. But is the profit we have arrived at, all the gain? Is it half of the advantage—the other not so easy, however, to compute in figures? We know that ingenious calculations may bring out conjectural profits so great and astonishing that the employers of steam ploughs themselves disown anything like such marvellous expectations. Still, it is unreasonable to deny prospective gains because they may be of a rather large pattern.

In the speech to which we have alluded, Mr. Holland said that it took four horses to plough one acre a-day; that is, the ten horses he has sold off would have been master of two-and-a-half acres per day. But the steam plough, he says, turns over five acres a-day—just double. That is, one-half of his team has been displaced by a power which is equal to the whole; the total tillage force of the farm being, therefore, increased by one-half—so that what was three days' work is now

finished in two. Everyone knows that saving of time is a momentous point in the management of stiff soils—a little extra rapidity of operations ensuring not only a better produce, but often making all the difference between a fair crop and no crop at all. Shall we be deemed too wild and enthusiastic in putting a money-value upon this capability of accomplishing three weeks' work in a fortnight? Besides, what an advantage there must be in keeping off land when unduly moist, and sparing it that trampling which so consolidates and injures clay soil, and damages the growth of much cropping! And, more than all, if either the theory or practice of agriculture is worth anything as guides in the matter, what a further increase of yield may be certainly looked for from ploughing 8 to 10 inches deep for roots (as Mr. Holland now does) and 6 inches for corn crops, in place of the previous shallow cultivation! The question, then, is this—Will the hastening of spring tillage, the avoidance of poaching, and the extra depth of staple be together equivalent to—say, five tons more of roots per acre on the one hundred acres of fallow? At 8s. a ton for turnips and mangolds, this would be a gain of 40s. per acre, or £200. And in the two hundred acres of wheat and barley, will the earlier seeding, the greater timeliness of operations, according to the state of the weather, the more effective breaking and pulverization of the soil, the freedom from treading, and the result of the deeper staple to that previously got for the roots, be altogether equivalent to four bushels increase of yield per acre—say, a gain of 20s. an acre, or £200? Putting these sums together, we should have £400 to add to the £256 7s. 6d. of direct pecuniary profit—making a total of about £656 per annum, or about 33s. an acre, won by the steam plough! Is there anything unreasonable in such an increase as we have here attempted to put a money-value upon? And if Mr. Holland's four hundred acres will yield a gain of £656 per annum, it would seem that an estimate once offered in these columns, of Mr. Langston's probable gain of £1,400 on eight hundred acres, was not so foolishly extravagant after all. Farmers will yet "right" themselves by the help of steam power.

THE FARMER IN THE FAIR.

What precious things are said and written respecting the capabilities and qualifications of the body of farmers as men of sense and business! Their mental powers and acquirements are estimated by the commercial and trading public as decidedly far inferior to their own, and who frequently put them down to the very lowest point, *i. e.*, as being "a slight remove only above the animals they drive"—"almost as dull as the clods they cultivate"—"a sad dull race of men, true clod-hoppers"—"the most ignorant class of the whole community"—"whose talk is alone of bullocks and business." What libellous assertions! Why, my good reader, I am ready to back this very body of farmers for good sound

sense, intelligence, and judgment, against any other class of men, of business habits, who conduct their own business. They have not been standing idle and inert amidst all the multitude of modern improvements; and as a class it will be found that they have contributed as much to promote a nation's wealth and prosperity as any other of our boasting classes.

We are somewhat indignant at the slurs occasionally cast upon us. We know that the Son of Sirach did ask this question, *i. e.*, "How can he get wisdom that holdeth the plough, and that glorieth in the goad, that driveth oxen, and is occupied in their labours, and whose talk is of bullocks?" And he goes on to say that, "He

giveth his mind to make furrows, and is diligent to give his kine fodder." This is good enough in its place; and perhaps in those early days, when knowledge was not over abundant, it was all that could fairly be expected of a farmer, and more particularly of an Oriental one living in an enervating climate. Be this as it may, I know the British farmers are a far different class of men. I speak not of the farmers of other countries; but of our own. I again say that for general intelligence they are equal, and in businesslike tact and judgment they are superior to most men. This is easily enough accounted for and shown. Their whole scope and success in business depend upon the prompt exercise of a correct knowledge of it, and to its being conducted with correct judgment. They have neither invoices of goods upon which to fix a profit, nor can weights or measures do much towards guiding their judgment in business operations, or in denoting quality. Tests cannot be applied: judgment alone is their safe guide.

Compare the facilities of other businesses and trades given to guide a judgment. In some it is the touch, the taste, the smell; in others the dimensions, the strength, the quality (the latter, in this and other cases, to be obtained by magnifiers); in others the weight, the measure, the hardness; in others the fashion, the colour, the fineness; in others by the given names, the tenacity, the form, or make; in others it is the place from whence the thing comes; in others it is the size, the sweetness, the dryness; and many other similar matters might be enumerated which serve to guide men in their business transactions. But what has the farmer to depend upon to guide his judgment in business? Nothing but his own knowledge and experience. Take him into *the horse fair*. He must be acquainted with the anatomy and physiology of the horse, or ten to one he buys an unsound one. He has not only to determine upon his paces, his strength, his looks, his colour, his age; but he has also to ascertain that he is free from disease, lameness, or blemish. Fancy a man engaged in commerce, manufacture, or trade, going into the fair, and having to decide as to the animal being free from all such evils as the following!—inflammation in any part, mad and sleepy staggers, distemper, influenza, megrims, ophthalmia, moon blindness, gutta-serena, pole evil, strangles, lampas, fistulous withers, sore throat, thick wind, roaring, chronic cough, broken wind, stomach staggers, diabetes, strangury, mange, warbles, glanders, farcy, strains in various parts, splints, bone spavins, ring-bone, blood-spavin, bog-spavin, thorough-pin capulet, curb cracks, grease founder of the foot, corns, running-thrush, sand cracks, pricks, quittor, treads, and cutting, and modifications of any of them. And yet the poor ignorant loon of a farmer is expected to know all these diseases; and he must act upon this knowledge, or he will speedily rue his bargains. Talk of business judgment! I know of but few cases where more is required than in the horse fair. Take the number and variety of the animals, their various forms, beauties, qualifications, adaptations, and capabilities, and I do not hesitate to say that he must be a man of true, sound sense,

knowledge, taste, and judgment, who can do business advantageously. Every farmer has to go there.

Take, again, *the cattle fair*. Here the farmer has not to judge of paces, strength, and blemishes, nor much of diseases; his great aim in the cattle fair is to find animals that will thrive and improve fast enough upon his pastures, to yield him a profit upon properly depasturing them. Here, again, he has to select such animals as are best adapted to his peculiar pasturage—fattening animals in their various stages of progression for his fattening pastures, suiting himself accordingly in their condition to the state and richness of his pasture, *i. e.*, a forward animal for a rich and good pasture, and a store animal for an inferior pasture, and young animals for his ordinary pastures. Nor is this all; he has to make his selection from a great variety of different breeds of cattle, and each breed differing much in quality and condition. In most of our large fairs we now find Shorthorns, Herefords, Devons, Scotch of various kinds, Irish of various kinds, Sussex, Norfolks, Welsh, and these of all sorts and sizes. Now, what is to guide the farmer in his selection? Why his knowledge and judgment truly, aided by touch or hand. For instance, he requires animals adapted to fatten speedily; he looks out for the docile temper, the mild eye, the pliable skin, the soft mellow hand, the expansive frame; if not to be found in one particular breed he turns his attention to another and another, till he finds what he desires: now, no novice can do this. How could he go amongst the congregated thousands and select a proper lot? Depend upon it, the farmer in the cattle fair must be a man of real sound sense, knowledge, taste, and judgment, to do business advantageously there.

Take, again, *the sheep fair*. Here the farmer has greater scope for correct knowledge and judgment than in the cattle fair, for he has not only to decide as to the propensity of the animals to thrive and fatten, but he has to estimate the quantity and quality of the wool they will leave him, as also their peculiar adaptability to the pasturage awaiting them; he, of course, has to make his selection accordingly. Now, the different breeds of sheep are as numerous and as valuable as those in cattle, and as suitable to the various localities and the quality of herbage for which they are designed. Our large sheep fairs will contain from 30,000 to 100,000 animals, and in some few cases many more, and these of various breeds and kinds. Pure Downs, Hampshire Downs, Shropshire Downs, Dorsets, Cotswolds, Leicesters, long-wools, Kents, half-breeds of very many and various kinds, besides the great variety of moor and mountain sheep. Is it to be supposed that a farmer can enter one of these large fairs to commence business, without some perplexity or some misgivings? It is generally a very anxious time for him, and amidst the immense muster of animals, each attractive in its way, he is often at a loss to decide which and what sort to select; the very number serves to perplex him. Then their various sizes, qualities, state, and condition, and their peculiar adaptation to his prepared pastures, serve to perplex him, and no

wonder. Verily, the farmer must be a man of sound sense, knowledge, taste, and judgment, to do business advantageously in the sheep fair.

It is so in the pig market; he has to decide as to age, quality, propensity to fatten, and adaptation for his peculiar keeping. "Poor piggy" has his various places to fill; it may be the fattening-stye, or the fallow-field: for each or other the farmer has to use his best knowledge and judgment in buying. In the sum-

mer he will require a small variety, or breed for porkers: in winter he will feed for bacon. Besides this, a consideration for his best market, and the demand arising there, must have due weight; coarse animals alone sell in districts where the population is poor, small porkers in richer districts. Verily it is a libel to class the farmer one whit below the average of his fellow-countrymen.

AGRICULTURE IN TASMANIA.

Of the several Australian colonies there are none that just at this time occupies a more favourable estimation in the eyes of the British public than Tasmania, better known perhaps under its original name of Van Diemen's Land. There are several reasons conducing to this besides its fertility of soil, picturesque beauty of surface, and salubrity of climate. Firstly, there are peculiar facilities offered for acquiring good land in country or agricultural lots, or for pastoral purposes, at from 10s. to £1 per acre; whilst in the unsettled lands grants of 50 to 640 acres are made to *bonâ fide* settlers, in proportion to the capital they possess—live stock, implements of husbandry, and machinery being reckoned as capital. Secondly, the colony has of late years been taking active measures to place its varied resources prominently before the British public. Specimens of its agricultural produce, grain, timber, and wools, have been shown at the Great Exhibition in 1851; in a special department at the Crystal Palace; laid before the Society of Arts; and at the Paris International Exhibition in 1855. Officially prepared handbooks, views of the island scenery, and every authentic statistical data have also been prepared, which cannot fail to be of great use to the farmer in search of a new and wide field of operation for his capital and industry. The climate and general character of the country, too, are such as specially to attract British settlers.

The mean annual temperature, as deduced from fourteen years' observations at the Colonial Observatory, Hobart Town, is 53 degrees. The highest registered during this period is 105 deg. The mean daily range of thermometer 60.65 deg., and the yearly fall of rain 21 inches; but on the western side of the island it is double this. Snow rarely falls, except on the high table land, and upon the mountain ranges. Continued frosts are unknown. The fine open weather which characterises the winter of Tasmania offers to the agriculturist those facilities for prosecuting the labours of his farm which he would in vain expect to find in any other part of the world. The conditions of climate are therefore not only admirably suited to the constitution and habits of an Englishman, but they are better adapted for the furtherance of his views and objects as an emigrant and farmer than perhaps those of any other possession or territory under the British Crown.

Much of the unoccupied land in Tasmania is still heavily wooded. The richest soils in the island usually sustain forest-trees of the largest dimensions; but where the trees are of large size they stand farther apart, and are of course less numerous on a given surface. In the best pastoral districts the trees are dotted as sparsely, and often in groups, quite as picturesque as in a nobleman's old domain in England. Here is an account of the natural features and capabilities of some of the localities: The plains at Oatlands and on the Upper Jordan afford valuable pas-

turage; the eastern and western marshes, now converted into flourishing agricultural farms, bear the heaviest of crops, and yield the richest and most succulent natural pasturage. The plains at Brighton and Bagdad, and at Richmond, Pittwater, and Sorell, on the south side, are famous for dairy farms and for abundant corn crops; and the Lawrenny plains, at the junction of the Clyde river with the Derwent, near Hamilton, stand unrivalled for soft beauty of surface and luxuriant pastures, but there is no other tract of country in the island possessing these qualifications which at all approaches the valley of the South Esk in extent and importance. The district stretching from the Lake river to the Meander, through Norfolk Plains, Westbury, and Deloraine, on the western side of this valley, may be looked upon at present as the granary of the colony. There, fields of wheat, oats, barley, turnips, potatoes, hay crops, and other products which characterise English farms, are now found in close series over a large surface of country, where a few years ago there stood heavily-timbered forests.

To the enterprise, intelligence, and active industry of the occupants of Tasmania is due the development of the vast resources of the far-famed gold colony of Victoria. For in 1834 the Messrs. Henty, of Lancaster, initiated the settlement of Port Philip by sending to Portland Bay and Port Fairy a large number of breeding ewes. The shores of Hobson's Bay and the banks of the Yarra-Yarra were occupied the following year by flocks introduced by Messrs. Bateman and Co., Mr. Falkner, and others. During 1836 and 1837 the exodus of settlers and live stock flowed from Tasmania in a continuous stream to Australia Felix; and at this time some of the most extensive and valuable sheep stations in Victoria are held by Tasmanian settlers.

The high premium afforded for labour at Victoria during the first days of the gold-diggings produced a convulsion in the labour market of Tasmania, from which it has scarcely yet recovered. Happily, the worst characters were the very first to move off, and few returned. The prosperity, wealth, and importance of a new country may be said to depend entirely upon population operating on its natural resources and capabilities. In the last twenty years we find that the population of Tasmania has about doubled. In 1840 it was 46,057, and judging by the latest official returns it must be now nearly 90,000. But with the abolition of transportation, the migration to the gold colonies, and the slow increase by immigration, this ratio can scarcely be maintained.

The industry and capital of Tasmania have almost from the very outset of the colony been directed to the production of three great staple articles of trade—wool, oil from the coast whale-fisheries, and wheat. With the culture of these, some collateral products, such as live stock and various sorts of agricultural

produce, and some new objects of industry, have grown into importance; for instance, the preparation of timber, and the growth of fruit and vegetables for the markets of the neighbouring colonies.

In no part of the world is wheat raised with greater facility, or of more excellent quality. Among the Tasmanian produce on show at the Crystal Palace is a sample of wheat weighing 70lbs. per bushel. Samples sent to the London Exhibition in 1851, and to Paris in 1855, were pronounced to be of first-rate quality, and obtained medals. In some districts of the island 50 bushels to the acre have been reaped; but the average return over the island is scarcely half that quantity. But the reasons for this are, the slovenly system of general culture, by over-cropping continuously with wheat without the application of any manure, and the selection of land free from timber, or nearly, which is generally the poorest soil, and ought to have fertilizers applied. The great advantages which the Tasmanian farmer enjoys in the fine weather of winter for his outdoor labours, of spring for his seedtime, and of autumn for his harvest—as it relieves him of all anxiety—might well reconcile him even to a comparatively light return; but it is not right that a deficiency arising out of defective farming should be attributed to the soil.

Within the last twenty years wheat has been sold in Hobart Town as low as 3s. 3d. per bushel; but the average price for the same period may be fixed at 6s. to 7s., a rate which, under the ordinary circumstances of wages, &c., pays the farmer well. According to the latest returns there were about 209,000 acres under culture with wheat in the colony. The exports in 1859 were 106,405 bushels, valued at £92,861, and of flour £105,128. The last Tasmanian advices report prime samples of wheat selling at 7s. to 7s. 3d. per bushel. The condition of the Melbourne market rules the price of wheat in Tasmania, as in most of the other colonies. About 36,000 acres are under cultivation with oats, yielding 918,881 bushels; it was selling, at the latest dates, at 3s. per bushel. Barley is not a favourite crop with farmers in Tasmania. The potatoes raised are excellent—quite equal, in point of dryness, to the best grown in England, and preferred for flavour. The average yield of the whole colony is 5 tons to the acre, but 7, 8, and in some cases 10 tons to the acre are obtained. English grasses are cultivated rather extensively for hay, and yield a fair return, horse-provender being always in demand in the colony, as well as in Melbourne. The price in December, 1850, was £4 and £6 per ton.

Passing to live stock, we find that there were in the island, in 1859, 20,559 horses. The gold of Victoria has now effected a transfer of much of the horse-flesh of Tasmania to the opposite shores. The cattle introduced into the colony are the Durham or shorthorn, the Hereford, the Ayrshire, the West Highland, and the Devon. These have all, at one time or other, and to a greater or less extent, been crossed with an original coarse long-horned variety, betraying Indian lineage or connection, and derived probably from New South Wales in the very earliest times of the colony. The Durham is the favourite breed, but it carries a frame and carcass too large for the natural pastures, save in exceptional localities, and it is too delicate in constitution; the Ayrshire maintains in the colony its high reputation as a milch cow, but the Devon is by far the best adapted in frame, constitution, and kindly feeding properties, for the natural pastures of the island, and it is decidedly a comely animal. The kylee, promises to yield a cross extremely well suited for the wild, warm, and humid feeding-grounds to the westward. The number of horned cattle in the island, in 1859, appears, by Government tables, to have been 79,950.

Pigs are extensively cultivated by farmers of every degree.

From the very commencement of the colony to the present time the work of clearing and cropping the land has gone hand in hand with the culture of live stock. Thousands and thousands of sheep are depastured over the high table-land of the interior, as there is found here a most ample supply of verdant pasturage at seasons when, on account of continued sunshine and drought, it is very scarce upon the low-lying sheep-runs to the eastward. Hence has arisen the practice amongst flock-owners of holding stations both on the lower and higher lands; the former for winter, and the latter for summer pasturage: a custom which has added vastly to the capabilities of the colony for depasturing sheep.

Sheep farming, from the earliest times of the Australian settlements as the resort of free colonists, has been regarded as the most profitable mode of investing capital. The capabilities and suitability of Tasmania for the production of wool of the finest fibre and highest value for the purposes of the manufacturer is well known. The high prices commanded in the English market by wool from the flocks of Messrs. Kermode, Smith, MacLachlan, and others, practically attest the fact. Its character was acknowledged to be of the highest order at the London Exhibition of 1851, and at Paris in 1855. The capacity of the island for maintaining a much larger number of sheep than are at present depastured there, can scarcely be doubted. For a long time sheep-owners in Tasmania cultivated fineness and softness of fibre exclusively, and the result was a delicate animal and comparatively light carcass; but a change took place with the rise in the value of animal food, and for many years past it has been the aim of flock-owners to combine length of staple with fineness of fibre to the utmost extent which they can command, a course by which they obtain a much heavier fleece, and a larger and probably harder animal. With this view the highly improved merinos have been crossed with the Leicester, New Leicester, and South Down breeds, and in many instances with great success.

The number of sheep in the colony has about doubled in the last twenty years. In 1839 the number returned was 898,590, and in 1859 1,697,199. There appears to have been a falling off since 1854, but on closely examining the returns we find the weight of wool exported in 1854 to have been 4,419,276 lbs.: in 1859 6,107,903 lbs.; and as there is a nearly corresponding difference in the value, it may be concluded that small sheep, of short wool and light fleece, had been replaced to some extent with sheep of larger frame and longer and heavier wool. Upon artificial pastures, along the north and north-west coast, where the climate is humid as well as warm, the Leicesters attain a size and weight little short of the prize animals exhibited at cattle shows in England, but they are not calculated to thrive on the comparatively thin natural pasturage. The Cheviots have been introduced, and, as might have been expected, are found to thrive prodigiously, and to increase rapidly; but it is a questionable proceeding to replace the merino crossed with Leicester blood, yielding a fleece of fine wool of rather long staple, for a breed that, however hardy, is remarkable for the vulgarity of quality in the wool throughout its fleece, and which scarcely bears a fleece heavier than that of the animal it supersedes.

The amount of increase realized from breeding flocks in Tasmania is dependent to a great extent upon the condition as to flesh, and health of the ewes, upon the nature of the pastures as to the abundance of grass, or the reverse, and upon the nature of the weather at that

critical season. On good, well-sheltered pastures, with ewes in fair condition, upwards of 100 per cent. is often saved; if at any time the yield falls much below 80 per cent. there is ground for suspecting some mismanagement; if it falls below 40 per cent. gross defects of management must have existed. One of the most ordinary causes of failure of increase in sheep husbandry is the very prevalent custom of overworking

the grazing, so as to produce an unnatural delicacy of constitution in the stock. In flocks where there is a fair proportion of breeding ewes, of wethers, and other dry sheep, the clip of wool is considered to be more than sufficient to defray all charges of management, and the value of the annual increase becomes the net measure of profit accruing.

HINTS ON THE CULTIVATION OF RACE.

A CHAPTER OF THE RECENT HISTORY OF EUROPE.

EFFECTS OF WAR ON RACE.

SIR,—The aristocracy of France of the old regime, of conquering Teutonic origin, affords an example of the natural result of inattention to the duties of their position which may not be useless. This class, become enervate and worthless under the comparative warm climate and luxurious dissipated habits of France, were driven out by the Celtic climate-suited aborigines, who constituted the great body of the working population. The aristocratic governments of the surrounding nations, jealous of constitutional liberty, and trembling for their own position, tried to coerce this movement of the Celtic masses, but were beaten in the attempt. This success in arms of the French people, however, producing a dominant military class, overthrew all hopes of a free constitutional government in France, and led to a military despotism, an Imperial Dictator, who being bred of war, and true to his calling, attempted to subjugate the neighbouring nations; and the energies of these latter being paralyzed by the rule of antiquated despots, he so far succeeded. The people of these nations, though stunned at first, in a little time became roused by foreign domination, repelled the invaders, and marched to the capital of France, but allowed their stupid governments to place one of the old effete regime of France upon the throne of his ancestors, at the same time leaving the whole land of the country in the hands of the aboriginal Celts. This was not what William of Normandy did when he conquered England. The absurd arrangement, of course, could not stand. No sooner had France time to renew her male population, mostly swept away in the war, than she drove the old Teutonic families from the throne; and now the former Imperial government is re-established under the able heir of the first Emperor, whose faculties have been cultivated by adversity. All this is a natural sequence, and might have been foretold to a nicety.

This struggle betwixt democracy and aristocracy during my own observation, extending to the time of the fight off the Dogger Bank in 1797, has cost millions of men and thousands of millions sterling of money. It has also prevented to a vast extent improvement and increase of population in Europe, as well as European colonizing emigration, which has during the last forty years of comparative peace been so advantageous to Britain. It has also burthened industry since that time, and for ages to come, with a vast amount of debt to the non-producing money lender. What might Europe not now have been, had her energies, capital, and industry been devoted to purposes of improvement during the great French wars, instead of destruction? It has been stated that these wars have lowered the average height of the French people

about 2 inches; the natural result of the *élite* of the men of France being all carried off in their early youth by Napoleon, to be butchered, or killed by over-marching and campaigning hardships, and only the infirm, the lame, the dwarfish, the refused of the army surgeon, left at home, of whom the present generation are the progeny.* Are we to have this play played over again, with the same unhappy results? Judging from the recent loosened tongues of the French Senate, their threats and boasting, and expressed jealousy and hatred of England, it looks a little like it. How very different from our feeling towards the French people!

* Being residing at Paris, previous to the foolish Elba affair, I one day met a very small man of martial step and mien, but having something of the look of a Chinese lady's foot, his large head corresponding to the not small ankle of the lady. I asked the little man how he came to have such a curious build? He replied, that at 14 years of age he was carried away by Bonaparte to the wars, that he had to march all day and throw up entrenchments all night, and often had nothing to eat, so grew no more, but was crushed together rather than expanded as a soldier. I also met numbers who had endured the Russian campaign, with bodies sadly mangled and extremities nipped, some even with the mind much affected, and scarcely able to speak—"the broken tools that tyrants cast away."

† Although regretting that the freedom of remark in the French Senate, which the increasing stability of affairs in France has rendered safe, should have been first exerted against Britain, I cannot but congratulate and rejoice with the French people upon this extension of freedom, and hope to see it soon further extended. There are many things in which the French should imitate the British, and the British the French; and the more the two countries come to resemble each other, and come heartily to act in concert, the better for both, and for the advancement of the human species. There is something in the Gallic and Belgic mind in advance of the English, though not of the Scotch, in plan—in geometric and mechanical science and design. Although not one-half so much practically a naval nation as the British, yet the affairs of the French dock yards and model of ships have long been fully equal or in advance of the British. Here there is a great and shameful defect in the British system of management, leaving the direction of the British navy to a few old ignorant lords nearly a century behind the age. The recent advance of the French in naval architecture will I hope effect a change in the British, and that a school of naval architecture, where science and practice should combine, be established. I may mention here that in my work, "Naval Timber," published more than 30 years ago, I attempted to draw public attention to a change in our naval architecture, stating that our large unprotected men-of-war were useless—that from their great size, affording a mark that could scarcely be missed, explosive shot from steam boats would tear them to pieces—that metallic cover, with sloping sides so that shot would glide off, was necessary; and at the same time, recommending a navy of steam boats, and of sea rams (the first who proposed such) of great strength and velocity, with nothing external but a sloping metallic cover. Yet the Russian war found us without a single effective steam boat, and the safety of Cronstadt and Petersburg, and, we may add, the length of siege and great loss before Sebastopol, was the result. Again, about 15 years ago I published an article, "Iron versus Wood," strongly inculcating an iron navy—that nothing could compare with an iron steam frigate. Slip copies of this were forwarded to the Lords of the Admiralty, and thanks returned, but without avail. Antiquated Admirals, with their foolish notions and prejudices, totally ignorant of mechanical science and engi-

The contest between the Goths and Moors in Spain was not less injurious to the race of the Spaniards. The result of competition in war betwixt men is very different from that of natural selection of organism in the wilderness. In war, when the soldiers are not raised by bounties, it is the bravest and strongest who are destroyed.

"In hairs at the shearing, nae youngers are jeering,
The bandsters are lyart and runkled and gray;
The flowers o' the forest, that fought aye the foremost,
The prime o' our land are cauld i' the clay."

In the Marlborough wars it was not uncommon for a regiment to be fought into cowards, the bravest all killed and the dross left. In the Moorish wars of Spain, it is said 3,700 pitched battles were fought during a period of pretty regular fighting of nearly 700 years. At the end of the lengthened Roman rule of some 400 years, the Peninsula, from the long period of comparative quiet, is stated to have reached a population of from forty to fifty millions. The Gothic conquest, and the sequent Moorish wars, reduced the Spanish population to about 12 millions, and destroyed nearly the whole of the land irrigation by which the south of Spain had been rendered so fertile as to support so great a population. Those long-continued wars account for the Spanish want of energy in modern times, and it only required the drain of the most enterprising of the remainder in the brigandage expeditions to Central and South America, to give to Spanish energy the finishing blow. Although also under other disjunctive influences, the subject of contention during the Moorish wars was chiefly religion. That cause of destruction in our more enlightened times seems on the decline, and now we have the noble cause of liberty, political and industrial. Here it unfortunately happens that extended political influence to the masses may lead to crushing despotism. We have France before us. To guard against this the utmost care is required, and an extension of our volunteer system seems the only safe way of warding it off. This system of advanced liberty would appear only practicable with the most advanced portion of the Teutonic race. A good working people-represented government can only exist where no priesthood have controlling power. I cannot believe that a representative Government can work advantageously with a population under priest influence, such as the Romish Church, the confessional and religion-monopoly afford. Let Italy and France look to this! Excepting in the case of France under the first republic, it is only Teutons who as yet have protested against Priest domination.

neering, were listened to—men with minds of one idea, bounded to timber ships, and ropes and sails, and ropes—ends—as fixed and limited as the instincts of the lower animals. Let any one read the recent work of my friend, John Scott Russell, "THE FLEET OF THE FUTURE: IRON OR WOOD?" and they will see to whose incapable hands the safety of the nation has been entrusted—millions of money thrown away upon comparatively useless ships. In the statements of Sir Howard Douglass, exposed by Scott Russell, they will find ignorance and misrepresentation combined. The pitiful figure made by our navy before the Sebastopol and Cronstadt forts was not even enough to convert bigoted imbecility in place and command. It was rather annoying to find the French first following out my plans; but what else could be expected from our system of mismanagement? The French too have one great advantage over the British in being free from class division. The whole people feel as one body of highly patriotic character. This we would do well to imitate; and there is only one way of doing so, by extension of the suffrage, and extension of our volunteer system to the working classes, with every volunteer an elector. There is also a nobility of character, a natural politeness, a gentlemanliness, extending to the poorest rank in France, not in word only, but in deed, which the writer himself has experienced. This we have much need to imitate. In return, the French should imitate the British in forethought, calm deliberate action, and steady indomitable perseverance. It is well that the British have dogged persistence to meet the French clan.

A curious system of war existed among the native population of New Holland previous to its occupation by the British, which accounts for the low grade even of savage life in those regions. It was the gentlemanly or chivalric code of fighting, for each party alternately to present the top of their head to receive a knock from their opponent's club, till one of the antagonist parties had enough. Whenever there was a head without a great block of thick bone covering and protecting, the owner was killed off hand, or his brain so stunned or addled as to render him disqualified to be a Thales, Numa, or Moses. This practice, in pretty constant operation for a lengthened period of time, would act in a similar manner to modify the race, though in a different direction to my theory of natural selection, and must have served to stultify—lower the mental capacity of the race. The same may have operated in a less degree in a country nearer home—"With the Sprig of Shillelagh." It is stated that the skull of the celebrated Scot, George Buchanan, was examined after his death, and found to be as thin as a wafer. In Germany, whence the British race derive their mental as well as physical stamina, mothers tie an elastic roll of about 1½ inch diameter of feather, wool, &c., round the head of their children at the brow, to prevent them in their numerous falls in infancy from adding their superior brains. Those of our fox-hunters who tumble as often as the children, and who may have brains worth protecting, should follow the same practice.

PATRICK MATTHEW.

Gourdie Hill, Errol, March 18th, 1861.

SOVEREIGN DRILL PLOUGH.—This new implement which, like the reaping machine, is a return gift, in exchange for the plough, from the New World to the Old, is the invention of Mr. L. Sovereign, of Western Canada. Its powers were tested on Thursday in a field near Peckham-rye, when five furrows were made at one time by a single plough drawn by two horses, which at the same time sowed with barley and clover, turning the furrows clean over the seeds so as to cover them safely from birds. This implement, which weighs no more than 5 cwt., is as rough and ready as a bush harrow, and, like all colonial machines, has no mechanism about it that a common tool-box will not suffice to repair. It consists of five ploughshares of cast steel, light and strong, placed transversely on a frame of five longitudinal beams. This frame is suspended on three wheels, two on one side and the other running in the furrow. The ordinary line of draught in ploughs is thus modified, and the friction of the weight carried off in the revolution of the wheels. Two boxes are fixed on the frame, one for larger seeds (from beans to wheat), the other for grass seed. The distribution is regulated by very simple mechanism—the mere turning of a screw by the driver acts by a wedge on a plate, which defines any given quantity to the acre; while a copper slide to each conductor closes or opens it according to the number of rows requisite to be sown. The advantageous simplicity of this arrangement will be evident to every practical man. A pair of light harrows were fixed behind, and thus completed the three processes of ploughing, sowing, and harrowing at one operation. The ploughshares are removable, and give place to scarifiers or cultivators where requisite, so that the implement may be termed a universal tool for all tillage purposes. It worked admirably on a wet and heavy soil, making straight furrows, and laying them over evenly; on lighter soils it seems to be extensively used. The plough tested was manufactured by Mary Wedlake and Co., from models supplied by Mr. Sovereign.—*Post*.

THE MANAGEMENT OF SWINE.

FRAMLINGHAM FARMERS' CLUB.

The fame of Mr. Stearn's pigs is the chief honour of the pleasant little village of Brandeston; and in undertaking to read a paper before the members of the Framlingham Farmers' Club on the management of swine, he determined to perform his task thoroughly, and so surrounded himself with the pigs on which his reputation rests. It must not be supposed that Mr. Stearn's pigs came led by a string tied to the leg, or covered over with a net in a dealer's cart. These pigs would scorn such treatment. A short time before the hour for the discussion there was a great commotion in the town. A procession of cars tastefully trimmed with flags, evergreens, and flowers passed through, the horses mounted by postillions in scarlet jackets and blue caps with scarlet tassels. The procession was received with cheers and much popular ovation. The occupants of these triumphant carriages were Mr. Stearn's pigs, come to take their part in the discussion at the Farmers' Club. This was held in the Corn Exchange, at the Crown Hotel; John Peirson, Esq., in the chair. There were nearly a hundred members of the Club and their friends present, many of whom came from a considerable distance. Among the latter was Mr. Sexton, of Cockfield Hall, Essex, Mr. Stearn's rival at the last agricultural show.

The CHAIRMAN, in opening the subject of the meeting, said the object of this club had always been the advancement and diffusion of agricultural knowledge; and as their good friend Mr. Stearn had more than once shown pigs equal to any in England, the members of this club had invited him to come and tell them the peculiar kind of breed he recommended, in which he had been so successful, and the mode of breeding them, that they might profit by his superior knowledge on the subject. Mr. Stearn, without a minute's hesitation, said that anything he could do to add to the usefulness of this club, which had been in existence 22 years, would give him the greatest pleasure. He was much pleased to see so large an attendance. Mr. Stearn would introduce the subject and allow them to discuss it afterwards. They might not all agree with Mr. Stearn, but they had all one object, which was to make pigs profitable. They were all aware that breeding was an important point, but feeding also had an important bearing. He had yet to learn the problem of making pigs, or any other cattle, fat without putting the hand in the pocket; he was informed the pigs at Brandeston cost nothing for feeding, owing to the excellent management of Mr. Stearn. (Cheers and laughter.)

MR. STEARN: I am called upon this evening to bring forward as a subject the management of swine. I suppose it includes breeding, rearing, and feeding. I will try to make a few remarks which perhaps will be a benefit to some of my neighbours. Now, in bringing this subject forward, I wish it to be understood that I have no secret, but shall be most happy to answer any question put to me to the best of my judgment. This class of the domesticated animals of this country is fast becoming one of the most important to the community. The inhabitants of Great Britain and Ireland are great consumers of meat, and more particularly the flesh of the pig, in all its varied forms of conversion into meat. The consumption of pork, fresh or salted; of bacon, dried or smoked; of hams, &c., is immensely great, and renders the progressive

improvement in the breeding and general management of the pig of great importance to the public; and in my opinion the keeping of swine is fast becoming something more than a mere means of disposing of the refuse of the farm, which would otherwise be wasted. I find this class of animal begins to be acknowledged amongst large breeders and graziers, instead of being thought beneath their notice; still, I am often surprised to see what a disgraceful lot of pigs are kept by many farmers, such as I am positive, if kept to any great extent, will ruin any man, for they eat an enormous quantity of food, but will neither grow nor fatten upon it. Our friend Mr. Bond stated at the last meeting our population had doubled in the last fifty years, and that we want to find out some means of producing more meat at the least possible cost to supply it with. Now, I am convinced that in swine alone, if the farmers would pay proper attention to the breeding, rearing, and feeding, there can be double the meat raised at little more than the present cost. I have had experience in management of pigs a good many years, as many in this room are aware. I exhibited a sow and pigs at the Framlingham show as long back as 1847, and gained the prize; they were then considered superior to anything that had been seen in this neighbourhood, and many said I should never produce another lot so good. But as Mr. Bond says, "we keep progressing," for at the Framlingham show last year I exceeded the former very much in weight at the same age. The same remark was then made again, but the two lots I showed at Birmingham and Smithfield were heavier still at the age; and now I suppose I may make up my mind I have got to my furthest in that point, as I have raised between fourteen and fifteen stone, fourteen pounds to the stone, at the age of between five and six months, dead weight; and between eight and nine stone, fourteen pounds to the stone, live weight, at between twelve and thirteen weeks old; and I think I have now in the breeding of that animal arrived as nearly at perfection as I could reasonably hope. But it is difficult to know where to stop, for even improvement has a limit, and crossing when carried beyond a certain point will generally end in deterioration. I think, however, to cross occasionally as far distant as possible is beneficial. There is no doubt that we derive our many varieties of the pig from the wild animal of the forest. The wild hog has been found everywhere, or nearly so, throughout the world. The contrast between the coarse denizen of the forest and the many sleek and beautiful specimens of our improved breeds is very manifest, and affords another proof of what may be achieved by the skill and care of the breeder. To give an extended outline or description of the original species, or of the various breeds and innumerable crosses and varieties of pigs, would occupy too much time, therefore I shall just describe our own Suffolk pig. In pursuing the subject further, I shall endeavour to show the great importance it is to the community at large, that the stock of pigs should be duly kept up, and every encouragement and inducement held out to breeders and feeders for that purpose. It is certain that 'none of our domesticated animals will afford such a large amount of food for human sustenance as the pig, in proportion to the readiness and expense with which it is raised, and the time necessary for raising it. According to all accounts the numbers now reared are exceedingly great,

and yearly increasing; there is no class of animals equally prolific that are of any great value to man. It is this view of the subject that so highly enhances the importance of the breeding, rearing, and feeding, and general management of pigs, and which I will now endeavour to describe as fully and as briefly as possible in accordance with the importance of the subject. I find that the profit or loss of the pig rests on the quality of the stock, and it must be kept in mind for what purpose the animal is intended, whether for bacon or pork; if for bacon flitches, you must choose a large kind, such as Berkshire; but if for pork, the small kind is most desirable, such as the Suffolk or Leicester, which are very similar animals; and every judicious breeder will have to take into consideration many circumstances in choosing a breed of pigs. The intent and purpose of breeding is profit. To ensure the greatest amount of profit, it would be well to consider the position in life of the population resident near one's own locality; his proximity to a good market, and the kind and quality of meat necessary for its supply. Formerly farmers had no means of conveying their swine to a favourable market, except the tedious one of driving them, or the expensive one of conveying them in carts. I have named as a matter for consideration the locality of the breeder; this is, however, in reality becoming of little importance, for communication by railway is now become so general throughout the country, and the means of transit so cheap and so easy of accomplishment, that every breeder will ultimately take this into account, and the advantages of it. He can send to whatever market is best suited to his purpose. There is a pig called the Improved Black Suffolk, which many persons prefer to white, thinking they are more hardy; but I have fairly tested the thing of late (which I suppose most present have been eye-witness to), and proved that the white will exceed the black as far as early maturity is concerned, and of course early maturity is where the profit is gained; and I find the better the quality of breed, the more lucrative it becomes, much less food being required. Now for our White Suffolk breed. In choosing the sow and boar the chief points are—a smallish head, with short snout, wide chaps; the ears rather small and thin, ends sharp, pendulous, and pointing a little forward; broad and deep chest; round ribs; long in the body and short in the leg; the haunch or thigh dropped almost to the hock; back broad, straight or slightly curved; shoulders and hams thick, and the neck to rise well behind the ears; small bones in proportion to the flesh; the hair to be long, thin, and silky; tail small and curled. Strict attention to these points in selection cannot fail of perpetuating good stock. Here I must add my surprise how careless breeders are in selecting the boar for their sows; if there happens to be a good animal within a short distance, for the going to which half-a-crown is charged, they will often send double the distance to a thoroughly bad-bred ugly brute for the sake of the gain of a shilling; whilst this apparently paltry gain is so much looked after, improvement is out of the question. But, gentlemen, instead of trying further to explain what the animals ought to be, I shall have great pleasure in showing you a specimen or two; and to show the contrast between a well-bred pig and a bad-bred pig, I have brought one from a neighbour's, about the same age as mine, as a breeding sow, from the opposite side of the road to my farm. You can, therefore, be your own judges, whether I have fixed on the right breed or not, for I do not like preaching without practising. As to the time for breeding, the sow should be from ten to twelve months old, and the boar from eight to twelve months. I, however, find that very few people will keep them so long, but breed them much earlier, which very often prevents their growing to the proper size, or acquiring

sufficient strength for breeding. I think good sized sows are best for breeding, and more likely to have a good number of pigs. Great care should be taken not to save one with less than twelve pups, for it is observed each pig selects a tit for itself. I consider twelve good even pigs to be sufficient for any sow to bring up. The sow I exhibited at Framlingham and Canterbury last summer, has brought up fifty-one pigs in four litters, without losing one. As far as my experience goes, the time of gestation averages about 113 days, or sixteen weeks and one day. Two good litters in a year is all we ought to expect. When a sow is in pig she ought to have liberty and plenty of exercise. The boars kept for stock should be confined in a shed with a roomy yard; if allowed to roam about, you are likely to get wrong in your breed. In managing the sow at the time of farrowing, my practice is as follows: To have a man with her to attend to her; for it is absurd to have all the trouble and expense of keeping a sow, then, at the most particular time, to leave her alone to take her chance. In my idea there is not sufficient attention paid to the construction of piggeries; I have seldom seen one which I did not consider too small, except perhaps just for fat pigs, which, of course, do not so much signify, for the less a pig put up for fattening moves, the better. But the farrowing pen ought to be large, to allow the sow plenty of room, and likewise to admit of rails being placed round the sides, so fixed as to prevent the sow lying on the young ones. These rails should be made to shift according to the size of the sow, I think in height from 8 to 12 inches, and extend out from the wall about nine inches, having the supports carried up sloping from the side, instead of straight up from the floor, like a model I have brought with me; then when the sow lies down, there will be no likelihood of her squeezing the pigs, as there is plenty of space left for them to pass between her and the wall, for nine times out of ten that is where the mischief is done, as sows invariably like to lean against something when they lie down. I have recently had a hundred pigs, without losing one from being crushed. Several gentlemen have told me lately they have lost a great number from that cause; but if they will take my advice with respect to the rails, I feel satisfied they will not have to complain of losing pigs from being lain on again. Each place ought to be, at least, from 8 to 10 feet square, and the best floor, I consider, is asphalt. No damp or scent can rise from that; I tried boards, bricks, and almost everything in the way of floors; most persons would say boards are best, but I think I can convince you to the contrary. If you will consider, for only one minute, they cannot be healthy; for if the boards are placed close, of course the moisture will stand, and the boards become saturated; and if a space is left, the refuse litter will go between, so it will become one mass of putrid matter underneath, quite level with the floor, whatever the depth may be; for what passes though will absorb the urine, and is likely to bring on many diseases. But I think it is well in the cold weather, to lay down a false lattice floor on the asphalt, so it can be taken up once a-week, and everything swept from under, for two or three weeks, when the pigs are very young. I have the beds attended to and fresh litter every morning, for I find the cleaner the place is kept, the better the pigs thrive. The floor being washed once or twice a-week, everything runs off, and the asphalt dries in a very short time. There is another great advantage: it does not take more than two-thirds the straw it requires for any other floor; for the moisture appears to run under the litter, without wetting it so much, as it is laid a little on the slope; what is taken from the inside, serves as litter for the pounds outside, which ought to be paved in some way to prevent the pigs from rooting. By following this plan, the

manure is made very regular and good. A tank should be made just outside, to receive the drainage from the pounds; the building to be troughed to take off the rain-water, to prevent the manure being washed. The pens ought to be so constructed as to be closed up, in cold weather, and well ventilated in warm. At the time of farrowing I allow a very small quantity of litter cut short, and have a hamper placed in the pen, with a little straw at the bottom, and also an old blanket. I put a slip or partition about two feet and a-half high, across the pen, to prevent the sow getting to the hamper; as the pigs come forth, put them into it, and cover them up, until the sow has done farrowing, after which, put them to her and let them suck. When done, put them back in the hamper, give the sow a little warm milk and bran; and whilst she is eating this, have the bed attended to, by removing all the wet straw, &c. Add a little fresh litter cut short; then when the sow lies down, let the pigs go to her again; by pursuing this plan, there is very little danger of losing them, for I believe one-third are lost for the want of proper attention. I always give the man sixpence per head, for all the pigs he can bring up to a fortnight old. I find this much the cheapest plan, for then there is no fear but he will see to them properly, and attend to them in the first instance, as well in the night as the day. How often do we hear people complain of the sow eating her own young! Therefore steps ought to be taken to prevent her doing so; for when once a sow does that, she is of very little use for breeding purposes. If you will allow me, I will explain what I have found to be the cause. In some litters the side teeth are much longer and sharper than in others; when this is the case, and the pigs begin to suck, they bite and scratch the paps, and punish and irritate the sow to such a degree, that it brings on inflammation, and the sow becomes mad with rage, she throws some one way, and some another. At last she bites them, and if she once draws blood, she will begin to eat them. Now the way to prevent this: when the pigs are a few hours old, I have them taken away in the hamper, so the sow cannot hear them, and nip those teeth out, with a pair of pincers. I should have lost a lot of thirteen some time since, if I had not pursued this plan, for the sow was as near mad as possible; she threw the pigs all over the place, and I had great difficulty in taking them away, for she would not allow any one to approach her. As soon as I had drawn the teeth, and put the pigs back, she was as kind to them as possible, and perfectly docile. I think about eight weeks old is a good time for weaning the pigs, and I like to have them operated upon a short time previous. As far as the feeding of my pigs is concerned, it appears the public know more about it than I do myself. Some say I give them sugared milk; some when they think my back is turned, put their hand into the troughs and taste the food, and say they are sure it is physic; others have stolen some of the food to have it analyzed. Now I will try and explain how I feed. I begin to feed the young pigs at five or six days old, with warm milk mixed with a little very fine sharps, and a small quantity of whole maize, out of troughs like some I will show you presently. For the first few weeks after being weaned, I have the boy feed them very often, but give them a very little food at a time, so they will clear the troughs out. In the winter I feed all with warm food, but not in the summer. I give them a great variety of meal, such as wheat, maize, barley, oats, and whatever is most convenient to mix together. I just wet it with cold-water, and then scald it with boiling-water, and sprinkle it with salt; between meals, I give them whole maize and mangel wurzel or swedes cut small; and once or twice a-day a little coal, but not too much, as it will be likely to do them harm. I allow them plenty of clean-

water, and there is one thing I am very particular about, not to give them any more food than they will clear up at a time. When pigs are put up fatting, it will be found very beneficial to wash them, at least once a week; this is quickly done by experienced hands, and will amply repay any one for the trouble. I also like to have them very often brushed. If you will only try the experiment between this and the common mode of treatment, you will be surprised at the difference. I have no doubt that many will say, "What a trouble!" But how can we succeed in any thing without trouble? I am certain the cottagers would find their pigs fatten a good deal faster, if they would wash and brush them, and feed them with warm food, instead of giving it to them like all ice. This would be a very easy thing, as most can keep a kettle by the side of the fire all day; they would find themselves well paid for the little extra trouble it might be. Store pigs ought to have their liberty as far as convenient, such as to range in large yards in winter, and the run of a piece of pasture in the summer. They should also be fed two or three times a-day. Good bred and well fed store pigs will always consume the refuse from the farm and dairy, when a bad bred one will refuse. I have never known mine refuse any thing, in the way of pig food yet, that was offered them, not even the prize animals. In my opinion the generality of pig-troughs are very badly constructed, so as to waste a great deal of the food, and soil it, by allowing the pigs to get their fore-feet in. I have tried a great many different sorts, and find those I have brought here to-night to be the best kind I have seen, to prevent both spoiling and soiling; they are called the light iron Norfolk troughs. They cannot be too feet according to the size of the pigs to prevent their getting deformed. Their shape is very often injured through not using a suitable trough. I have a great many different sizes, and use them to suit the animal. And now, gentlemen, if any of you would like to see my places and animals at any time, I shall be very happy to show them to you; but I can't say I wish to see you all at one time, I have had as many as sixty and seventy in a day, and that is rather too much of a good thing. (Prolonged applause).

The SECRETARY, at the request of Mr. Stearn, then read several letters from gentlemen to whom Mr. Stearn had sold pigs, in proof of the statements he had made. Earl St. Vincent, of Godmersham Park, Canterbury, said the pig he had purchased of Mr. Stearn had grown into a very handsome sow, and had now a litter of pigs, and every body who saw her admired her. Taking her as a specimen of Mr. Stearn's breed of pigs, it would be difficult to find any to surpass them. Mr. Gladding, of Hoath Court, Chislehurst, near Canterbury, said with respect to the pigs he bought of Mr. Stearn, at Canterbury, at the Royal Agricultural Show, last July, he had been much afraid the good condition they were in would, in taking them to his common feeding, soon give proof of their having been kept on better food; but to his surprise they not only kept their own, but improved on very low diet. They had given him the utmost satisfaction. A letter from Mr. Baker, of Beverley St. Stephen's, Canterbury, said the pigs he had of Mr. Stearn were unquestionably superior to any he had bred before. His bailiff, a man of seventy years' experience, was fearful, as they fattened so fast on common food, they would be fit only for fatting; but he had been agreeably surprised by the young sow producing eight fine pigs on her first farrow. A letter from Mr. George Turner, of Ipswich, was to the same satisfactory effect.

Some extraordinary specimens of Mr. Stearn's success in the breeding and rearing of pigs were then brought into the room, and engaged the attention of the meeting for more than

half-an-hour. The first animal produced was a breeding sow belonging to a neighbour of Mr. Stearn, which was produced as a contrast to his own. When this animal was placed side by side with one of Mr. Stearn's, the contrast produced a great deal of merriment; but we were informed by those competent to speak on the subject, that the unhappy pig which was produced as a foil on this occasion was not an unfair sample of the run of young breeding sows. Its age was about nine months, as was also that of one of Mr. Stearn's, placed beside it: the former weighed four stone, the latter about 16 or 17 stone. Mr. Stearn also showed three white Suffolk sows in-pig, of remarkable weight and proportions. The last specimen shown was a young boar from the Framlingham and Canterbury prize sow. Mr. Stearn also showed one of the light Norfolk troughs he uses, along the top of which he had added a bar to prevent the pigs from attempting to leap over, in doing which he said they would often break their legs. He also produced a specimen of the wedge-shaped lattice he uses, which has the effect of fending the sow from the wall when she lies down, and so leaves room for the young to escape uncrushed. These contrivances were simple and excellent, and served, no less than the wonderful specimens of the pig tribe which he exhibited, to convey an idea of his great care, perseverance, and skill in the work in which he takes so much delight.

The CHAIRMAN said that whatever opinion the meeting might entertain of the merits of these pigs, there could be but one opinion as to the thanks that were due to Mr. Stearn for the able paper he had read. It appeared to him there were but few objections to be raised. The matters were mainly such as they all believed to be necessary for the proper management of pigs, but they often flinched at the trouble. Cleanliness, warmth, and feeding—they all agreed that those were requisite things; but Mr. Stearn carried into practice what many agreed to only in theory, and did not take the trouble to carry out. Mr. Stearn had alluded to the early maturity of the white pig. Now he knew there were many black pig-men in the room; and if they still stuck to their black pigs after what Mr. Stearn had said, he hoped they would get up and state their reasons. The specimens which had been brought into the room were certainly such as they seldom saw. And then the crates Mr. Stearn used were worth their attention: he (the Chairman) had been told there were not better crates in England. He was well aware that there were many in that room who had tried some of the things Mr. Stearn recommended, and would testify to their efficacy. He did not know what some of them would say to the scrubbing brush (laughter). He had no doubt the cleanliness, the washing, and the scrubbing, made the feed go much further. He should be glad to hear something on the question of black pigs.

Mr. W. JEAFFRESON acknowledged the obligations of the meeting to Mr. Stearn, and said he wished to ask one question, as he was a little bit of a pig-man himself. One of Mr. Stearn's observations was that coal was advantageous to a certain extent, but not too much. What was the quantity of coal that ought to be given to a pig?

Mr. STEARN said, that not being situated as Mr. Jeaffreson, not being acquainted with the properties of coal, he had had to be guided by experience, and in gaining that experience he had been very near losing many of his pigs. He used coal as an astringent, and it acted almost immediately; but in two or three cases he had given too much, and had been near losing the pigs. They must be guided by the age of the pig in using the coal: he never allowed anybody to give it but himself. To a pig from seven to nine months old he

should give, if the animal required anything of the sort, about as much coal as would lie in the palm of his hand, twice a-day.

Mr. J. MANN offered some remarks from his experience of the breeding and rearing of pigs. He said he scrubbed his pigs, but not every day; he rubbed them very frequently with a dry horse-brush. For lung disease he gave linseed meal, and he found they recovered upon it. He had examined the lungs of pigs after they were killed, that had been affected with lung disease, and he could mark how the oily matter of the linseed had arrested the disease. He believed cleanliness to be one of the greatest points in reference to the growth of pigs; his sties were always washed down clean, and the manure taken away every day. If he had the means he would carry out Mr. Stearn's plans: he was convinced it would pay. To put the growth of well-managed pigs down in figures, the heaviest pig would average a growth of one pound per day, and one stone over, in seven months.

Mr. STEARN said that one of his stock, not of his own breeding, at twenty-eight weeks old, weighed 16 stone 8lbs. dead weight.

The CHAIRMAN: Mr. Mann, were yours black or white pigs?

Mr. MANN said his were not pure stock; some were white, some blue and white, and some black and white; but he cordially agreed with Mr. Stearn that the better the breed the better the growth.

The CHAIRMAN asked Mr. Stearn whether he put his pigs on young clover?

Mr. STEARN said the hide of any white pig would crack upon young clover.

Mr. W. JEAFFRESON asked Mr. Stearn whether it was his custom to endeavour to reduce the fattening qualities of the sow while breeding?

Mr. STEARN: I assure you that these very pigs are fed as common as we can feed them to keep them alive (laughter.) I am perfectly aware none of you will believe me, but these two animals have been kept as low as possible, for breeding purposes.

The CHAIRMAN said he bought a pig of Mr. Stearn, one of his prize litter; he put it in the yard, and asked his man to reduce her for breeding; but it was of no use: they kept her as low as it was possible to keep her alive, and she was almost as fat as ever. But if Mr. Stearn said they bred just as well, there was no occasion to bring them down.

Mr. STEARN said his sows, notwithstanding their fatness, would bring up twelve or fourteen pigs, and after the first litter they would average ten at every time.

Mr. H. BLOOMFIELD said he had been waiting to hear some practical farmer ask some questions which he should like to have answered. The observations of Mr. Stearn reminded him of an anecdote of a farmer who had made himself remarkable for his fine team of horses, and was questioned as to what he fed them on, when his reply was that they had nothing but a little chaff and bean-straw, but the bean-straw was only half thrashed (laughter). Now, it seemed to him to be quite impossible to imagine that any animal could be in that uncomfortable state of obesity in which these pigs were, unless they consumed a large quantity of food of some kind. There was an immense quantity of adipose substance in them, they were enormously fat, and to suppose they could be brought almost to suffering, as they were, without an immense portion of food of some kind, was absurd. It could not be done with those doses of coal. He believed Mr. Stearn had accomplished, perhaps, more than any man now in this part

of the country. The animals before them must be taken as evidence of the most extraordinary industry and perseverance in stuffing that any man could possibly conceive. It appeared that from the very earliest moment, at the sixth day after they were born, they were taken from the care of the mother, and fed with a little milk and sharps, and perhaps with a little sugar. Was there any sugar?

MR. STEARN: Certainly.

MR. BLOOMFIELD said he received that candid statement with a great deal of satisfaction and delight, and he hoped that any observation that he might make would not be supposed to arise from impertinence (Hear, hear). Any more important subject he conceived they could hardly entertain and, therefore, it was most important to know the kind and breed of animals that would produce the largest quantity of fat on the smallest possible quantity of corn, and he thought certainly very little fault could be found with the breed of the animals before them. But he believed a challenge had been offered by Mr. Stearn, and he offered this as a proof that there was so much in the management, that he would sell some of his best animals, and then that he would beat the best animal he had parted with. It was not too much to say that Mr. Stearn had surpassed every breeder and fatterer in this county, and he hoped he would be prepared to tell them the kind of feed the animals consumed, for instance, in the first six, seven, or eight months. When he had done that, he (Mr. Bloomfield) should have no hesitation in pronouncing Mr. Stearn to be a very prince of pig breeders and fatteners. He hoped Mr. Stearn would give them some information on that point.

MR. STEARN: I will tell you what I will do; I will allow any one to take that pig, and the club shall employ a competent person to feed and take care of him for a week, or two months, or what period you like; and I will engage to say that that very pig will consume less food than any pig of half the weight in the country, and you shall feed him on anything you think proper.

MR. GEORGE LING, of Bedford, near Wickham Market, said Mr. Bloomfield appeared to discredit what Mr. Stearn had stated. He was not going to tell the meeting what Mr. Stearn's pigs ate: he only knew that when Mr. Stearn decided to lay the floors of his piggeries with asphalt he employed him (Mr. Ling) to do the work. When the men came home he asked them how the pigs got on; and the men said the pigs got on they did not know how, for they did not seem to eat anything. The men were there all day long, and were surprised at how little the pigs ate. He was glad to find Mr. Stearn was satisfied with the asphalt. He hoped Mr. Stearn would advise everybody to let him lay their piggeries with asphalt (laughter).

MR. STEARN: I should very much like to have some competent person feed one of those young breeding sows for two or three weeks. I think he would feed her so that she could not rise at all, and think he was going to starve her too. We can't give her little enough. I have not kept her up to bring her here.

THE CHAIRMAN: May I venture to ask a kind friend who has come a long journey from Essex (Mr. H. Sexton, of Cockfield Hall), whether he has heard any argument to induce him to change his blacks for whites? I know Mr. Sexton and Mr. Stearn are good friends, and are glad to meet each other; but I know Mr. Stearn is more afraid to meet him in competition than to meet any other man in England.

MR. SEXTON said he had not been in the black-pig line long, but he was still of opinion that they were harder than white. Mr. Stearn said his pigs could not stand young clover; now the black ones would, and their coats did not crack. The blacks did not want so much scrubbing; not more than once in three months. He did not feed them with coals; they did not require it. He could not afford coals. He thought the blacks were harder, quite as good breeders, and would fat quite as quick. They were certainly first-rate pigs Mr. Stearn had shown them; but he hoped he should meet Mr. Stearn in competition again some day, and he would endeavour to lick him.

MR. STEARN: Mr. Sexton speaks of my scrubbing, and does not agree with using so much soap. I don't think it costs so much as rose oil, such as I saw him use (loud laughter). We don't wash them more than once a week.

MR. SEXTON said he was glad to learn that Mr. Stearn had begun to do a little in the black pig line.

MR. STEARN: Mr. Sexton seems to beat everybody in black; I can beat him in white, and I am determined to beat him in black. Mr. Sexton's are certainly the best black pigs I ever saw in my life.

THE CHAIRMAN said if no gentleman had any other practical question to ask, he thought it his duty to return, in Mr. Stearn's name, and in the name of the club, their thanks to Mr. Sexton for coming so far to visit them this evening. It was no little honour that they had in their club-room at that discussion the two most celebrated pig breeders in England. They might go into the discussion-room of a hundred Farmers' Clubs, and they could not say what they could say this evening. These two gentlemen went to the Royal Agricultural Society's meetings anywhere in England, and stood at the head of the list. They returned their thanks to Mr. Sexton, and if ever they had another agricultural show in Framlingham, they would guarantee him the very best accommodation to show his pigs, and a well-aired bed for himself. They also thanked Mr. Stearn for a sound practical lecture in a short compass.

Some further conversation arose, in the course of which

THE CHAIRMAN asked Mr. Sexton what he gave his pigs, and whether he gave the food warm or cold?

MR. SEXTON said as soon as the pigs would eat, he gave them a little meal or oats: the oats whole. He never gave them any peas till they got twelve or fourteen weeks old; he found it cramped them.

MR. STEARN said he never gave peas at all.

MR. SEXTON said lentils and oats were the principal food. He ground the lentils, and after a time he ground the oats, and gave them wet with a few sharps and middlings. When the pigs were over three months old he gave them barley, and a little before that time, but not much. He also gave a small proportion of maize. He gave everything cold, in winter and summer. He found if he gave warm victuals when the pigs got eight or ten weeks old, their lungs were gone. He sold his pigs for London, at between four and five months old, at about 5 stone. He generally killed them at from 40 to 70 lbs. weight. He got the young pigs to eat as soon as they would. He could get them to eat a little at six or seven days old. He did not agree with keeping the sows over well.

THE CHAIRMAN said the secret seemed to be, oats, instead of barley; and making the pigs eat early.

OBESITY AND ITS ORIGIN IN CATTLE.

It has been said that Hubback, the founder or primogenitor of our improved Shorthorn breed, inherited obesity constitutionally, and that the disease is hereditary in his offspring. Without subscribing to this in all its entirety, one thing must be admitted as matter of fact, that too many of this breed are subject to this disease. That it is hereditary is generally acknowledged in the medical world, although not a few deny it; but granting the truth of the doctrine, that certain maladies become hereditary, of which we may quote scrofula as an illustration universally admitted, and that obesity, like scrofula, is also hereditary, how are we to account for its origin? It is manifestly not confined to the Shorthorn breed, or even to black cattle generally; sheep, swine, and poultry being all subject to it. It is equally manifest that our domestic animals were not created diseased; on the contrary, it has been recorded for our information that the award pronounced was one of the highest merit, viz., "VERY GOOD." Such being the award at the first great exhibition of live stock by an infallible Judge, how are we to account for the change that has since taken place, seeing that *obesity* is so prevalent at all our great exhibitions of the present day?

Plain, practical questions require corresponding answers; and the solution of the above one may be compressed in one word—extra feeding, or, more generally speaking, mismanagement. There cannot be a doubt but farmers have themselves to blame for the prevalence of obesity amongst their cattle; for the existence of such a disease is not to be found amongst wild animals, or even an approximation to it, especially where they have an abundance of both summer and winter keep. It is only where recourse is had, under artificial systems, to forcing and cramming animals with artificial food unnatural to them, that obesity and its kindred maladies make their appearance.

The class of diseases just mentioned, and the mismanagement that gives rise to them, thus merit a special notice.

In medical science, although very considerable progress is now being made in pathology, we have not yet attained the length of being able definitively to say what *obesity* really is; opinion is very much divided on the subject, but writers, generally speaking, mention two kinds "*Polysarcia carnosa*," and "*Polysarcia adiposa*," the one having reference to an imperfect state of the flesh, and the other an imperfect state of the fat; at the same time many confine it to the latter. Under this general, although very unsatisfactory definition, may be included all the diseases in question, viz., *obesity* and its kindred maladies arising from forcing, on improper or unnatural food.

In the investigation of our subject it will only be necessary, however, to examine somewhat closely the quantity and quality of the flesh and fat of such animals now so justly condemned as being unfit for human food. In all other branches of industry the quality of the article produced for market is considered the practical index to the degree of perfection to which art has attained in that particular department. That the rule is as sound as it is practically efficient in the economy of things must be generally admitted, and that it is applicable to all agricultural products sent to market by the farmer is equally true. But when we begin to apply this infallible test to the prize cattle shown at our Christmas fat stock exhibitions, the quality of the meat, "*fat and lean*," almost

prompts one to conclude that the opposite is true, and that the philosophy of fattening cattle has nothing to do with common sense and the stomach of the public! than which nothing can be more absurd or farther from the truth. The quality of breeding stock exhibited at our summer meetings is equally subject to censure. It is, therefore, the duty of farmers and the agricultural press to investigate the matter as thoroughly as the limited progress of science will permit, pointing out with an impartial and unsparing hand the objectional quality of the "fat and lean" of the animals thus bred, fattened, and sent to the shambles, to supply our tables with one of the chief necessities of life.

Avoiding as much as possible the scientific expressions used in medical books, the fat of those animals examined about Christmas and other times by us, during the last twenty years, has been, with few exceptions, soft, and of an oleaginous character, badly coloured, and having a heavy, loathsome, and somewhat sickening smell. It is very unequally distributed, the adipose tissue in some parts being empty, and not of a very healthy-like appearance; while in others every sac was full, and crammed as it were to bursting: sometimes the inside was full, at other times the principal amount of fat is deposited on the outside of the carcass. We have frequently seen examples of this latter kind, both beef and mutton, objected to by customers as too fat, the butcher being obliged to pare off large slices, and cast them to the waste tub for the tallow-chandler; whereas had fat and lean been properly mixed, and of good quality otherwise, then the meat would not have been objected to, or considered a bit too fat. The meat of healthy animals, when the fat and lean are well mixed, being, as it is termed, "finely marbled and coloured," soon finds a customer, although the proportion of fat is upon the whole very large. When half, or sometimes three-fourths of the soft inferior fat has to be pared off, the remainder is often poor flabby-looking stuff. Were it possible to pare off this fat during the lifetime of the animal, and put on the outside covering (skin) again, that hides all faults at our Christmas shows, the poor brute then would appear fitter for the dog-kennel than the shambles. Farmers would be ashamed to see such animals leaving their premises as fat stock; and yet this is all they send to market, that is sold and bought for food.

In the cooking of this inferior quality of fat, it is subject to another diminution of weight—a process of reduction before the fire, the soft, fluid, and oily portion separating from the more solid, both becoming very indigestible. When boiled the waste of meat is equally great, while the soup or broth requires a vast amount of seasoning to make it "sit upon the stomach." Indeed very few stomachs, even among the poorer classes, can digest such broths. In short, the daily experience of every class of society proves, by data of the most authenticated kind, that the fat of such animals is wholly unfit for human food.

The lean meat of such animals is also of a very inferior and even unwholesome quality. It generally contains a deficiency of fat, but an excess of water or juicy matter. Quality, however, in both these respects is very diversified. There is some, thing very anomalous, in the former of these conditions, that the lean of meat condemned as being over fat should at the same time contain too little fat; but when we enter upon the

examination of the whole facts of the case, the existence of such an anomaly is necessary, to account for what has already been noticed—that the fat is not properly mixed with the lean but deposited by itself in certain parts of the body, the adipose tissue in some places being empty. The greater portion of the adipose tissue of the lean, for example, is empty, and not in a very healthy appearance. The very fact that it is empty proves, beyond a doubt, that it is not in a healthy state; for were it in a healthy state, and the functions of secretion active, fat would be deposited in the empty tissue of the lean, more easily than in other parts where the tissue is already crammed and too full. But these functions being deranged, and in a debilitated and inactive state, the consequence is, that fat is not deposited where the healthy action of the muscular and nervous systems requires it to lubricate their respective parts, and thus preserve their usefulness in the economy of life. Under such circumstances a certain degree of morbidity must be experienced during the lifetime of the animal, arising no less from imperfect alimentation and secretion, than from the imperfect excretion of waste matter, and its removal from the body; consequently, the moment the animal is slaughtered and life extinct, the decomposition of the meat rapidly takes place; and in warm, soft, muggy weather, its appearance, before it gets the length of the table, is more easily imagined than described. Some stomachs and peculiar constitutions may digest such meat, and assimilate it, without sustaining harm, for a time; but, generally speaking, it is dangerous food, being liable to lay the foundation of hereditary and other diseases in the human constitution. It is only fit for cats and dogs, and other carnivorous animals, whose digestive organs appear better adapted naturally for such food.

The conclusion at which we have thus arrived as regards both the fat and the lean of a large and, we fear, increasing portion of the fat stock slaughtered, says very little for our attainments in the art of fattening cattle, and the course pursued by our fat-stock clubs and agricultural societies for the improvement of breeds. But the more sweeping censure has yet to be pronounced when we consider the fact that this inferior quality of meat is produced by animals suffering from hereditary disease, more especially since it must at the same time be acknowledged that this hereditary tendency is the result of our own misdoings in the management of our cattle. When such are the facts of the case, facts that cannot be denied, it is certainly high time to inquire if the practice now being pursued in the improvement of the breeds of cattle and in fattening them for the shambles is founded upon a solid foundation. One of our best authorities in medical science says, in reference to man, "No organ or texture is exempt from the chance of being the subject of hereditary disease." Is this applicable to our cattle? The concurring testimony of all who have practically examined both sides of the question answers it in the affirmative. Indeed, no scientific doctrine has been more satisfactorily established at the bar of experience than this, that "*like begets like*" in the breeding and fattening of cattle, and none more than the hereditary tendency to produce the inferior quality of fat and lean under consideration, especially when the animals are fed on the objectionable food and system of forcing that first gave rise to this hereditary tendency.

That this tendency to yield inferior meat is produced by the improper food now given to cattle, and the mode of treatment to which animals are subjected, is susceptible of very easy proof. We have only but to study the nature of this tendency, what it is, and its prevalence amongst our improved breeds, both neat cattle and sheep, to be satisfied on this point; for

in such examples we find that the more the producing means are used, the more prevalent is the disease amongst stock and its hereditary tendency in their offspring. Such animals during life may present a fine pleasing exterior. The general symmetry may be good, and the handle fine, according to the ordinary rule. The animal may lay on fat faster than any of its rivals belonging to other breeds, and yield a greater weight of carcase for a given quantity of food consumed. All this may be true, and the reader will at the same time perceive that so far all this is also perfectly in accordance with the peculiar characteristics of obesity, for those of mankind who have this disease cannot prevent themselves from getting fat, round, and plump, even on a short allowance of food, while the moment they begin to indulge in plenty, on the forcing system, they then, like too many of our improved high-bred cattle, soon lose the faculty of locomotion. It is when we get beyond the external anatomy of the ox, sheep, and pig, to the internal anatomy, and begin to examine quality—how much of the dead weight of the carcase is fit for human food, how much must go to the tallow chandler, the dripping-pan, and the dog-kennel that we can form a just estimate of the facts of the case, and how practically they prove the soundness of our proposition. When once the carcase is cut up on the butcher's stall, then obesity with its kindred maladies manifest themselves in an unmistakable manner, as we have endeavoured briefly to show in a previous paragraph; and when our roast and boiled appear at table, we have then ample data before us to prove that the system of breeding and fattening stock producing such meat is as unprofitable to the farmer as it is injurious to the health of the consumer, and reprehensible when examined professionally from a scientific point of view.

Some farmers will doubtless experience no small difficulty in acknowledging that corn and cake, mangolds, hay, and straw, are not the natural food of our cattle—that they are objectionable in many respects, and, when given under the mode of treatment to which live stock are subject, are capable of producing disease; and not only producing disease, but at the same time an hereditary tendency in their offspring to disease. It will no doubt be equally difficult to convince them that little food consumed and heavy weights in return is not the most profitable system of feeding. And yet the facts of the case leave both these conclusions manifest. The above artificial food now given to cattle is a very imperfect equivalent for the natural food they ought to receive, while their close confinement in badly-ventilated houses and household treatment generally are incompatible with the development of healthy organism, yielding a fine quality of well-mixed fat and lean. In both these respects there is a wide field for improvement; and with regard to obesity and its kindred maladies, "it is not all gold that glitters," says the proverb; and the farmer is sadly mistaken if he thinks he gets a large price for what goes to the tallow-chandler, the dripping-pan, and the dog-kennel, or even for the inferior meat that reaches the table of the consumer. Cattle salesmen make the best they can of both good and bad. Butchers may "cut their fingers" once or twice, but they cannot make a practice of this as a general rule, while the public is beginning to adopt very stringent measures for putting an end to the commerce and consumption of diseased meat of every kind, so that the grievance of bad meat, like all similar grievances, is likely sooner or later to rectify itself. The hereditary tendency to obesity and the other maladies producing an extra quantity of inferior fat and lean, unfit for human food, is almost invariably attended with its counterpart—a tendency to "consumption," "worms," "lice," and the long list of maladies

that send so many cattle to the dog-kennel and knacker's caldron. From a commercial point of view, the interest of the public ought unquestionably to be the farmer's rule. And even from a scientific and economical point of view, the best quality of meat at table is the only solid foundation on which to base the improving of our breeds of cattle; but to this we shall return as the subject of another lucubration. Meantime we shall only farther add, that as the hereditary tendency to the diseases in question terminates, under a certain force of

circumstances, in an extra weight of inferior quality of both fat and lean, and also terminates, under a different force of circumstance, in what we shall here designate, for the sake of brevity, poverty, or a deficiency of weight, it can hardly be surprising that the fattening of cattle under such a system is pronounced by so many to be a losing concern, and that the times are growing worse than they were, even with all the improvements we are making!

W. B.

THE ROT IN SHEEP, AND THE VIEWS OF GERMAN NATURALISTS.

So much has recently been said and written on the rot, or bane, in sheep, that, were it not for the great importance of the subject, and the absence of any authoritative teaching by the professors at the Royal Veterinary College, any further discussion in these columns might be thought inopportune. When, however, it is considered that the loss entailed by this malady on the farmers of Great Britain has been estimated to amount, in ordinary years, to not less than two-and-a-half millions sterling, and that serious doubts are entertained whether meat in any but a perfect state of health and soundness can be eaten by man with impunity, it will be admitted that anything which tends to throw a light on this dark and perplexing problem is entitled to grave attention. Professor Simonds, it is satisfactory to know, is engaged in a series of investigations: while it may interest the agricultural public to be informed, as briefly as possible, of what has been already ascertained by previous inquirers.

The fluke, which infests the liver and biliary ducts of sheep affected with rot, is known as the *Distoma hepaticum*, and is an entozoon, or internal parasite, of the *trematode* (adhering by suckers) order. Professor Owen, who has written very briefly on the form and characteristics of this species of entozoon, in "Todd's Cyclopædia of Anatomy and Physiology," says that, in extremely rare instances, it is found in the gall-bladder and ducts of the liver of the human subject; and Dr. Lankester, in the Appendix to his Translation of Küchenmeister on "Animal and Vegetable Parasites," mentions a case which occurred in the practice of a country surgeon, where an undoubted fluke was extracted from behind the ear of a sailor. Our object in mentioning these isolated instances is not to excite alarm, or create an unnecessary digression, but simply for the purpose of explaining how it happens that so little has been done by English naturalists and pathologists with a view to illustrate the particular points in which the agricultural public are more especially interested.

It is a well-known fact that Dr. Edward Jenner was led, by his observations on the ailments of cattle, to draw those important conclusions with reference to the human subject which conducted to his great discovery of vaccination. Since his time, however, the tendency of public opinion in England has been to draw so strong a line of demarcation between the treatment of disease in man and the inferior animals, that a great social gulf divides the two classes of practitioners. The effect of this absurd distinction has been to deter aspiring minds from a branch of study which, however important in itself, confers no proportionate reward on those who pursue it. Hence it occurs that the treatment of the diseases of cattle, notwithstanding all the grave physiological questions which are frequently in-

involved, has been remitted exclusively to the veterinary practitioner; and, to use the emphatic language of Lord Berners, on a recent occasion, "with all respect for the veterinary art, it appears as yet to be only in its infancy." In Germany, a totally different class of influences has prevailed. With the march of improvement in the microscope, there has been a corresponding desire among scientific men to explore the great mystery of animal organization in its lowest types; and though, a few years ago, a drawing-room doctor at the West End of London would have recoiled from the imputation of passing his time in the study of intestinal worms, the discoveries of Steenstrup, the Danish naturalist, have not only invested such inquiries with interest, but thrown a flood of light on the hitherto-secret operations of Nature.

As the researches of Steenstrup, and more especially his remarkable work "On the Alternation of Generations,"* have given an entirely new direction to the studies of naturalists—teaching more especially that entozoa such as the fluke only reach a perfect state of development after passing through several stages, and that it is vain to look for them in their perfectly-developed forms in any other situations than the liver or other congenial organisms—it may tend to strip the subject of a great deal of needless mystery, if we briefly describe what is meant by this process of *metagenesis*. For this purpose we cannot do better than quote a few of the introductory remarks of Steenstrup himself in reference to his very interesting discovery:

"By the words 'alternation of generations,' is meant, the remarkable and till now inexplicable natural phenomenon of an animal producing an offspring which at no time resembles its parent, but which, on the other hand, brings forth a progeny which returns in its form and nature to the parent animal, so that the maternal animal does not meet with its resemblance in its own brood, but in its descendants of the second, third, or fourth degree or generation, and this always takes place in the different animals which exhibit the phenomenon in a determinate generation, or with the intervention of a determinate number of generations. This remarkable precedence of one or more generations, whose functions it is, as it were, to prepare the way for the later, succeeding generations of animals destined to attain a higher degree of perfection, and which are developed into the form of the mother, and propagate the species by means of *ova*, can, I believe, be demonstrated in not a few cases in the animal kingdom. * * * * In the class entozoa my researches have sufficed to prove, not only the existence of such an alterna-

* A translation of this work by Busk, was published, by the Ray Society in 1845.

tion of generations, but to show besides that traces of a similar development are visible in almost all the divisions of the class. According to recent observations it is, however, exhibited most clearly in the *trematoda* [the order to which the fluke belongs], in which I prove that *cercariae* are the larvæ of *distomata*, and that they become true *pupæ*; that the animals in which the *cercariae* originate, and grow up are trematode individuals descended in the second or third generations from *distomata*, and consequently not produced from their ova, but which, however anomalous they may at first sight appear, constitute a precedent generation having for its object the perfecting of the subsequent one."

In other words, while animals like the horse and cow produce young which are miniature copies of themselves, the process of reproduction in various classes of entozoa is so conducted that whilst, until the offspring has undergone several forms of gradations of being, each succeeding one dissimilar to those which preceded it, it does not attain to the "dignity" of the parent stock, *yet*, in several of these gradations, the larva as it approaches maturity has the power of developing a number of creatures resembling itself, just as though, to use the language of Dr. Lankester, "the caterpillar had the power of producing in its interior any number of young caterpillars, each of which would grow into a perfect butterfly." This may seem a very round-about way for nature to work in, but it at once explains the difficulty that has hitherto attended every effort of English observers to detect the precise form in which the larvæ of the fluke find their way into the gall ducts of the sheep, there to undergo their final stage of development. The theory is, at all events, more rational than that of equivocal generation, in which scientific men of a by-gone era were content to enshroud their imperfect knowledge, and we shall very inadequately perform our duty if we shrink from the wide field of investigation which is thus opened up.

According to Gerlach, as quoted by Küchenmeister in his "Manual of Parasites"* (vol. i. p. 268), the eggs of the liver fluke (*distoma hepaticum*) have been administered to lambs without producing any ill effects upon them. From this circumstance, in conjunction with the theory of Steenstrup, it is argued that the body of the sheep does not afford a congenial nidus for the hatching of the ova, and that the ova, after leaving the body of the sheep, must pass through one or two gradations of development before the organism of the sheep is favourable to their maturation. Siebold, in his treatise "On the Origin of Intestinal Worms"—another of the authorities for the knowledge of which the English public are indebted to the labours of the Sydenham Society—says (p. 4): "It has been ascertained that at particular periods of their existence, the intestinal worms undertake emigrations, and these often very extensive ones, in order to reach that animal whose organs are by nature fitted for their habitation," and after illustrating his position by a reference to the reproduction of tape-worms, he observes that "the same thing holds good with regard to the ova of the *dismotata* that infest the livers of our ruminating animals; their eggs, after they have been transferred from the liver to the gall ducts, being washed out with the bile into the intestine and evacuated with the feces." But what becomes of the ova after their liberation from the body of the sheep, and in what form or stage of development do they find their way back to it?

Here we confess that the researches of German helminthologists fail to give us that precise and positive information which alone can be regarded as conclusive or satisfactory. Steenstrup, it is true, as stated in an early part of this article, gives the result of his observations up to the point which is most critical and important, but there he stops; and though we agree with Küchenmeister (vol. i., p. 268), that after 1855 "it was not difficult to conjecture that sheep, rabbits, men, &c., might infect themselves by devouring small mollusca inhabited by the brood of the *distoma* in question, which were living upon the grass of the meadows, or by swallowing small aquatic mollusca, or free broods of *distoma*, when drinking from stagnant, marshy waters," yet this, after all, apart from the scientific phraseology in which it is couched, carries us very little farther than the observations of a practical agriculturist, who, in the second volume of the Bath Society's papers (A.D. 1783), remarks as follows:

"They (the flukes) are swallowed with the sheep's food while in the egg state. The common or most obvious objection to that opinion is, that this insect is never found but in the liver or some parts of the viscera of sheep that are diseased more or less; and that they must, therefore, be bred there. But this objection will lose its force when we consider that many insects undergo several changes, and exist under forms extremely different from each other. *Some of them may, therefore, appear, and be well known under one shape, and not be known to be the same under a second or third. The fluke may be the last state of some aquatic animal, which we at present very well know under one or other of its previous forms.* If this be admitted, it is easy to conceive that sheep may, on wet ground especially, take multitudes of these ova or eggs in with their food; and that the stomach and viscera of the sheep being a proper nidus for them, they of course hatch, and appearing in their *fluke* or *last state*, feed on the liver of the animal and occasion the disorder. On killing a sheep lately, which was seemingly in good health, I examined the viscera carefully, and in some of the passages leading to the liver, which appeared turgid, I found a whitish thick liquor, which appeared to be all in motion. On applying a pocket-glass, I found it to contain thousands of these flukes, which were apparently just hatched [developed], and about the size of mites. These, if the sheep had not been killed, would probably have soon attained their usual size, and produced its destruction. I am, therefore, of opinion, that if experiments were made by some of the faculty to discover what would most speedily kill these insects when taken fresh and alive from a diseased liver, it might lead to the discovery of something that might have the same effect when given internally as a medicine. We find worms can be destroyed in the bodies of animals, and why not the fluke in the liver of the sheep?"

We cannot say whether Lord Berners had this article in view when he complained that "the veterinary art is still in its infancy;" but certainly, after surrendering ourselves to a very patient investigation of the writings of Steenstrup, Küchenmeister, and Siebold, we are more than ever constrained to admit that though our present observations may be more accurate and precise, yet for all *practical* purposes we know little more of sheep-rot than we did eighty years ago. Even Sir Anthony Fitzherbert in his "Boke of Husbandry" (a second edition of which was printed in 1530), says, "white snails be ill for sheep in pastures and in fallows," and though a vast amount of

* Translated by Dr. Lankester, and published by the Sydenham Society, 1855.

labour has been incurred in the attempt to determine whether *cercariae* have tails or not, we have it on the high authority of Professor Simonds himself, that "it is still a matter of doubt whether *cercariae* become parasitic to other creatures, such as small *water snails*, and undergo higher development in them before entering the sheep to undergo

their last change." The subject is one of very great importance, but till naturalists have determined the exact form of the creature which enters the organism of the sheep, and is there developed into a perfect fluke, it is premature to hope that any specific for the prevention or cure of the malady will be discovered.

COMMON ROAD LOCOMOTIVES.

The steam-horse in our thoroughfares is daily becoming more and more a national necessity. Steam and machinery may not inaptly be termed the backbone of England as regards her industrial system, and steam conveyance by sea and land the spinal marrow and ligaments that hold the vertebrae together. As bone grows, so must nerve, ligament, and muscle; otherwise the industrial fabric will become deformed. Parts must grow proportionally to the importance of their functions. Thus our population is increasing rapidly; our steam manufacturing machinery is keeping pace with this increase; so is our steam shipping interest; our railway locomotion is not falling much behind. But here we stop short of progress in the right direction, for our thoroughfares are, by reason of these increases, virtually in "a dead lock;" while in the cultivation of land, and cartage of its produce by steam power there can hardly be said to be much more yet than the first signs of life. There is a structural deformity here, a deficiency of vital force in that part of the system yclept "*common road locomotion*."

In the outset of our subject it thus requires no proof to show that the steam-horse in our thoroughfares and common roads must receive every manner of fairplay at the hands of the public and the Legislature. Indeed it must appear manifest to every one conversant with the subject, that this branch of the industrial fabric merits every encouragement that can possibly be given it, whether in the form of legislation, public patronage, or the investment of capital.

Patentees and the proprietors of traction-engines experience in the want of certain statutory provision a great drawback to the investment of capital necessary to carry out successfully their proposition; while on the part of very many no doubt well intentioned members of the community, there still continues to be harboured a vast amount of prejudice to steam in our thoroughfares and common roads, owing to the limited view they take of the subject, and the imperfect medium or daylight in which they examine its vastly great, but undefined proportions, the different members of the system appearing distorted.

Many more than the writer of this are beginning to be apprehensive that too many of our senators, in both branches of the Legislature, are as yet only examining the steam-horse in a somewhat cloudy and misty atmosphere.

The day no doubt begins to dawn; but the rays of light are so intercepted by clouds, fogs, and the "Will-o'-Wisp" beings who continually inhabit such a horizon, that some minds appear so bewildered as hardly to be able to say to what class of animals the steam-horse actually belongs—whether the useful ones that merit their patronage and support, or to the other class, whose disappearance from the regions of *terra firma* is always considered a heart-felt relief.

It is, however, to the general public that the steam-

horse must show his symmetry, and discover to what denomination of beings he really belongs. In the daily struggle of life, necessity often compels people to take a different view of things than, otherwise situated, they would often do; and at the present time, many more friendly eyes are turned towards the steam-horse than there were but only a few years ago. Time is equivalent to money in the commercial world; and the daily-increasing delay already experienced in the British capital from an overcrowded state of the streets so curtails profit, as to threaten ultimately the complete annihilation of trade. "Small profits and quick returns" have become established axioms in successful business. This, too, has in no small degree arisen from the triumphs of steam and the changes brought about by this powerful agent. But the growing delay now experienced in street traffic is diametrically opposed to both these axioms: hence the impropriety, if not impossibility, of fighting any longer against a current which must eventually sweep everything before it. Again, in the provinces, or at the other end of our railway system, the progress of economy has already taught the agricultural interest that the horse is an expensive motive power—one that soon eats off its own head—and that things, generally speaking, cannot remain much longer in the position they are now in. In short, a farm-horse is not only expensive to keep, as to food and tear-and-wear on his carcase, but his feet do an immense harm to the drainage and aëration of land, while they are scarcely less destructive to roads, so that it were difficult to put a proper estimate upon the losses the provinces at present sustain.

Such, then, being the heavy burden now borne by both town and country, it is no more than natural to propose laying it upon the steam-horse. In point of fact, he is already at work; and that the result will be a complete triumph, must appear manifest to all who know anything about his capabilities in harness. What is now wanted is the necessary statutory provision required by capitalists, and the combination of connecting interests to form working systems of steam traction or common road locomotion.

We now come to the *modus operandi* of extending our steam-conveyance traffic through the instrumentality of public companies and individual enterprise, so as to meet our growing exigencies in both town and country. In all questions of this kind the prudent course to pursue is to examine closely in all its bearings every proposition, to see if it is sound in principle, with a view to get systems based upon a solid foundation. Expediency may have her claims, but there is a common-sense in everything of this kind that cannot be gainsayed.

In all our large towns we have our wholesale and retail business. There are here two principles involved, which are just as applicable to the conveyance of goods as to

their sale; and as necessary to be attended to as regards economy and profit, before justice can be done to capital invested in this branch of commerce.

To the former of these principles, the wholesale one, our railroads belong, and also our steam-boat traffic, where goods and passengers are only taken up and landed at certain stations and landing-places. From and to these stations and landing-places the working of the retail principle is exemplified in the distribution of goods and passengers to their final destination, or in the collection of them for wholesale conveyance. The *modus operandi* of working both these departments of conveyance is so well understood, and so familiar to all, as to render farther illustration under this head unnecessary.

Now in the extension of our steam locomotion the further reduction to practice of both these principles is involved; while we have at the same time to attend to the economy of horse-conveyance, whether on the principle of wholesale or retail, that must of necessity exist both in town and country. So far as through traffic is concerned, economy both as regards time and capital is obviously in favour of steam. On this particular point there cannot be two opinions. It is obviously, therefore, the interest of the public that railways should be extended, so as to perform as much of the wholesale or through conveyance as is possible on the present plan; and when this limit has been attained, tramways, and the other wholesale systems of common-road steam-locomotion now proposed, may be reduced to practice.

The following example will best illustrate this part of our subject, and how far it bears upon the interests of the readers of the *Mark-Lane Express*. After fat stock, dead meat, corn, and the thousands of tons of agricultural produce annually sent to this metropolis, arrive at the different railway termini and wharves in the river, &c., such goods have to be conveyed on the wholesale or through traffic principle to their respective destinations for retail distribution, much to the injury of the quality of the goods, and still more to the pecuniary loss of all interested. It is the through traffic of such and all similar goods, to which may be added railway and steam-boat passengers, that is now causing so much obstruction in our streets, and that is threatening at no distant day to put a final quietus upon trade. Now, the whole of this through traffic can easily be done by the steam-horse at a fraction of the expense it now costs by horses, in much less time, and at a still greater saving as to the injury done to goods and passengers, partly by the extension of our present railway system, and partly by street-railways, tram-ways, and traction-engines on common-roads. In the provinces again, it is possible to organize, if we may so speak, common-road locomotive systems to do the whole through traffic by steam—delivering commercial goods at the various villages, oilcakes, artificial manures, &c., at the home-steads of farmers, and collecting in return, for railway-stations and shipping ports, passengers, fat stock, dead meat, corn, and other agricultural produce, at much less expense both as to time and money than they now cost the village merchant and the farmer. All this falls within the legitimate province of the steam-horse, who is already harnessed and at work; and that he will go through his task triumphantly, requires no proof.

But the through traffic, to which we have just drawn attention, is not all that falls within the domain of the steam-horse. Experiment has already proved that he can do a vast amount of heavy detail work more economically

and better than horses. Owing to the elasticity of the steam in the cylinder under the piston he can stop in going up or down hill or on level ground with much more certainty and ease than a team of common horses can do, and also start on his journey again. In this respect his action is similar to that of the steam-hammer. When this huge implement was first proposed to be wielded by steam, many were apprehensive that it would break everything to pieces; yet, in the hands of this new agent the tons of solid metal forming the hammer are apparently as light as a feather, and the stroke as soft and gentle as the circumstances of the case demand. Just so is it with the steam-horse. He can stop in the steepest incline, with his twenty, thirty, or forty tons, far easier and safer for himself and the public, than the best team of horses in the British capital can stop an empty waggon, omnibus, or we may safely say Her Majesty's state-carriage. For stopping and starting, in the collection or distribution of goods, he is infinitely superior to the common horse. There is only one condition which is imperative—he requires a heavy load before he will pay. Light work for horses: the heavy work for steam—all the traffic, be it observed, that is now experienced killing for our teams.

It will thus be seen that this new field in which steam has been harnessed is a very important one to all sections of the community, and that success, in a great measure, depends upon the proper arrangement of the work which the steam-horse is more peculiarly qualified to perform. Under skilful management he will perform his work better in less time and for less money than it is now done, and with more satisfaction to his employers in a business point of view, while our crowded streets and thoroughfares will be relieved of the indescribable hubbub and confusion which they daily exemplify. These are advantages that can hardly be over-estimated, especially in the British capital—the metropolis of the world, in a commercial sense. Here every theory that economises time and money, and promotes the general despatch of business, demands something more than a mere passing transitory approbation or complimentary acknowledgment. Whatever the situation in life may individually be, public duty can have but one voice in such matter, viz., to uphold by every public means the progress of the steam-horse in the great national undertaking upon which he is now entering. If there are any who have prematurely arrived at the conclusion that he is intended for butchers' boys and green-grocers, in the distribution of chops and potatoes for the million, they sadly under-estimate his locomotive functions. This is not his calling. Although an elephant can pick up peas and pin-heads with the greatest facility, who ever dreamt of keeping an elephant expressly for such purpose? Like all other animals, the steam-horse has got his own peculiar professional talents; and if these are skilfully directed in the proper sphere of business, he will prove himself a profitable servant to his employer and a fruitful source of wealth and comfort to his country.

ENGINEER.

THE RED DURHAM.—The conversation, which was at a high pitch of animation when Silas approached the door of the Rainbow, had, as usual, been slow and intermittent when the company first assembled. The pipes began to be puffed in a silence which had an air of severity; the more important customers, who drank spirits and sat nearest the fire, staring at each other as if a bet were depending on the

first man who winked; while the beer-drinkers, chiefly men in fustian jackets and smock-frocks, kept their eyelids down and rubbed their hands across their mouths, as if their draughts of beer had been a funeral duty attended with embarrassing sadness. At last, Mr. Snell, the landlord, a man of neutral disposition, accustomed to stand aloof from human differences as those of beings who were all alike in need of liquor, broke silence, by saying in a doubtful tone to his cousin the butcher: "Some folks 'ud say that was a fine beast you druv in yesterday, lob?" The butcher, a jolly, smiling, red-haired man, was not disposed to answer rashly. He gave a few puffs before he spat, and replied: "And they wouldn't be fur wrong, John." After this feeble delusive thaw, the silence set in as severely as before. "Was it a red Durham?" said the farrier, taking up the thread of discourse, after the lapse of a few minutes. The farrier looked at the landlord, and the landlord looked at the butcher, as the person who must take the responsibility of answering. "Red it was," said the butcher, in his good-humoured husky treble—"and a Durham it was." "Then you needn't tell me who you bought it of," said the farrier, looking round with some triumph; "I know who it is has got the red Durhams o' this country-side. And she'd a white star on her brow, I'll bet a penny?" The farrier leaned forward with his hands on his knees as he put his question, and his eyes twinkled knowingly. "Well; yes—she might," said the butcher, slowly, considering that he was giving a decided affirmative. "I don't say contrary." "I knew that very well," said the farrier, throwing himself backward again and speaking defiantly; "If I don't know Mr. Lammeter's cows, I should like to know who does—that's all. And as for the cow you've bought, bargain or no bargain, I've been at the drenching of her—contradick me who will." The farrier looked fierce, and the mild butcher's conversational spirit was roused a little. "I'm not for contradicking no man," he said; "I'm for peace and quietness. Some are for cutting long ribs—I'm for cutting 'em short, myself; but I don't quarrel with 'em. All I say is, it's a lovely carkiss—and anybody as was reasonable, it 'ad bring tears into their eyes to look at it." "Well, it's the cow as I drenched, whatever it is," pursued the farrier, angrily; "and it was Mr. Lammeter's cow, else you told a lie when you said it was a red Durham." "I tell no lies," said the butcher, with the same mild huskiness as before; "and I contradick none—not if a man was to swear himself black: he's no meat o' mine, nor none o' my bargains. All I say is, it's a lovely carkiss. And what I say, I'll stick to; but I'll quarrel wi' no man." "No," said the farrier, with bitter sarcasm, looking at the company generally; and p'rhaps you didn't say the cow was a red Durham; and p'rhaps you didn't say she'd got a star on her brow—stick to that now you're at it." "Come, come," said the landlord; "let the cow alone. The truth lies between you: you're both right and both wrong, as I allays say. And as for the cow's being Mr. Lammeter's I say nothing to that."—Silas Marner.

"OUR AMERICAN COUSIN."

Mr. Samuel Thorne, Thorndale, Washington Hollow, Duchess Co., N.Y., occupies a very distinguished position as a short-horn breeder, having formed his herd, at very great expense, on some of the best blood which could be procured in Great Britain and Ireland. Thus, amongst other animals of high mark he owns Duchess 66th, bred by the late Lord Ducie, and for which 700 guineas were paid at the sale of his lordship's herd, her calf being sold at the same time for 300

guineas; also Frederica, Lalla Rookh, Buttercup 2nd, Miss Butterfly, and Pearlette, from Col. Towneley's herd; Peri, bred by Mr. Bolden; Minerva 4th, bred by Tanqueray; Victoria 26th, bred by Mr. R. Holmes; Maria Louisa—by Hopewell, out of Rose de Meaux—from the late Mr. St. George Gray's herd; and, finally, without enumerating the rest, he has been using those famous bulls, Grand Turk (12,969), and 2nd Grand Duke (12,961). Such a collection naturally drew many longing looks "across the western ocean," until at last the desire, on the part of some breeders on this side, became a fixed determination to have, and accordingly we find that towards the close of last year Mr. Langstone, M.P., Saraden Lodge, had hired "5th Duke of Thorndale," a son of Grand Turk and Duchess 66th, from Mr. Thorne, and that Messrs. Robinson, Clifton Pastures, and Charles Howard, of Biddenham, had entered into a similar arrangement for Mr. Thorne's "2nd Duke of Thorndale," by 2nd Grand Duke, dam Duchess 71st, a 650-guinea daughter of Duchess 66th. During the course of last autumn the occupants of the Thorndale pastures were diligently examined by a very plucky specimen of an Irishman—Mr. Fitzwilliam Welsh—who had determined on establishing a thoroughly good herd of Short-horns at Trough House, Co. Clare. The magnificent proportions of Lalla Rookh very soon took his fancy, and he lost no time in securing her splendid bull calf—then about nine months old—by Grand Turk. Prudence, however, dictated the propriety of leaving the young 'un with his dam for some time longer, and it was only, therefore, just before Easter that a special ambassador was sent over to America for the purpose of attending on "Our American Cousin" in his various perils "by flood and field" in his passage from Duchess Co., New York, to Co. Clare, Ireland. Fortunately, all has gone well, although the voyage was both stormy and longer than usual, and on Sunday, May 12, the illustrious stranger reposed for the first time on Irish soil, where we trust he is destined to spend many useful days, and be the means of filling many entries in our Royal prize lists. Having been afforded an opportunity of seeing "Our American Cousin"—the name given him by his new owner—we must say, the first point which struck us was his great size for his age. He was calved on the 13th of December, 1859, but he looks nearly as large and furnished as many two-year-old bulls. This feature he inherits from both sire and dam, and he promises to be fully as large an animal in every respect as Grand Turk. His head and eye tell at once of his sire, and the former is well set on to a moderately lengthy neck, which runs into a deep, wide breast. He is very rich in the flank, and his quality all over is all that could be desired. His constitution is evidently remarkably good; his hair is beautiful, and of a beautiful colour. Notwithstanding the fatigue of the voyage, he looked wonderfully fresh and lively, weighing over 13 cwt. as he stood. His first coat was 1,000 dollars, and adding freight and all other expenses, he now stands Mr. Welsh 1,200 dollars, or say £240, and he is well worth every farthing of the money. Everybody knows what Grand Turk was and did before he left England, and Lalla Rookh was the winner of the first prize at the great Yorkshire show in 1853, and the first prize at the Royal North Lancashire show in the same year. Upon both these occasions she beat "Vestris," and the next year, Lalla Rookh being in America, "Vestris" carried all the first prizes in her class wherever she was shown; "thus showing," as the Thorndale catalogue remarks, "that Lalla Rookh's equal was not left in England." She was also winner of the first prize as the best cow at the United States Show at Philadelphia in 1856. We may also state that she is a remarkably prolific cow. With such a parentage, combined with his own good qualities, we feel justified in thinking that "Our American Cousin" will prove creditable to Mr. Welsh's discrimination, and profitable both to him and to the country.—*Irish Farmers' Gazette.*

SOUTH AUSTRALIAN PROGRESS.

We called attention recently to the advance in prosperity made by the island of Tasmania, and we would now advert to another most flourishing Australian colony—South Australia—whose progress has been rapid in the extreme. It is little more than twenty years since the colonists obtained possession of their country lands there, and now South Australia—notwithstanding various disturbing and depressing influences which have affected it—may take rank with any of the elder colonies for substantial improvement, social condition, and industrial progress. Although statistics are not very pleasant reading at any time, yet, like the Chancellor of the Exchequer, we can scarcely make our statements and comparisons properly intelligible without a liberal use of figures.

We may state at the outset, for the information of those unacquainted with the fact, that the colony enjoys a salubrity of climate generally maintained throughout the temperate regions of Australia. The mean temperature of the year is only one degree higher than that of Madeira. A kind of fever affects newly-landed persons, but this, with dysentery, readily yields to proper treatment. In 1850 the population of the colony, according to the census then taken, was 63,700 souls. At the close of last year it was estimated at 127,000, or just double. The amount of land revenue was in 1850 £98,899, or 29s. per head of the population. In 1858 (the latest official return) it was £205,065, or 27s. per head. The number of acres cultivated in 1850 was 64,728, being a very small fraction over one acre per head of the population. In 1858 the land cultivated amounted to 264,462 acres, or more than two acres per head of the augmented population. The cultivation of the soil within the past eight years has therefore not only kept pace with the increase of the population, but in addition to that has doubled itself per head. Nothing can be more satisfactory than this conclusion. There are 19,000 square miles leased for pasturing—on each mile of which there must be by law at least 12 head of cattle or 50 head of sheep—1,400,000 acres granted or sold, and 198,000,000 acres ungranted.

Closely connected with the cultivation of the land is the exportation of colonial produce. This in 1850 amounted to £545,039, or about £8 11s. per head of the population. In the three years ending 1858 the average value of native produce exported was £1,712,075, or about £15 5s. per head of the population. The colonial produce exported in 1859, included cereals £554,265, hay £2,906, animals 16,379, wool £484,977, dairy produce £12,183, wine £1,023, which with mineral produce made a total of about £1,500,000. The exports of wool, which in 1850 were but 3,266,017 lbs., had risen in 1858 to 8,101,768 lbs., while in 1857 the wool exports were 10,101,000 lbs. Some portion of this comes from New South Wales

and Victoria by the Murray river to Adelaide for shipment. The colony will doubtless continue to enlarge the sphere of its agricultural operations. The recent explorations in the south-west afford good reason to believe that vast tracts of fresh pasture ground exist in that direction, which, together with the increased development of the navigation of the Murray and its tributaries, must still further augment the value of the wool exports from South Australia, which, it will be seen, have already trebled in ten years. Abundant evidence also exists that the copper mines of the colony are capable of yielding a much greater supply of that valuable metal than has ever yet been raised. Lead and other minerals are also exported. And whilst the raw products of the colony have been raised to an extent much exceeding the numerical increase of the population, the same may be said of the manufactures of the colony. The total amount of revenue raised in South Australia in 1850 was £238,992, or £3 18s. per head; in 1859 it was £700,000, or £5 10s. per head. This not only represents the amount of taxation, but is inclusive also of all moneys paid into the Treasury for the purchase or rental of the Crown lands of the province. All Crown lands are open to purchases at the upset price of £1 per acre for country sections; but all sales must take place by public auction. The Government acts on the principle of not reducing the upset price of land. But the average price per acre has rather declined of late years, having fallen 2s. to 3s., and may now be quoted at about 25s. per acre.

The total quantity of crown lands sold from the year 1850 to 1858 inclusive was 1,355,623 acres, in sections of about 80 acres each, or about 2,118 square miles. The amount realized for the same was £1,839,687, showing an average price per acre of 27s. 1d. The settled portions of the colony do not yet occupy a twentieth part of its entire extent.

Almost all the South Australia towns have sprung up or are springing up near the mines. The agricultural and pastoral districts have villages, hamlets, stations, and homesteads; but they have not, nor are they likely to have, any large centres of population. The seaport towns, which serve as outlets for the produce of the agricultural and pastoral districts, are steadily increasing in population and importance. The population of Adelaide, the capital, is now about 25,000.

The introduction of railways, the extension of inter-colonial steam communication, and the connection by telegraph with the other colonies, have done much to improve South Australia.

In 1850 there were 208,568 acres of land under various kinds of crops, of which 174,184 acres were enclosed. About 42,000 acres were under wheat, and 1,785 under potatoes. In 1858 there were 264,462 acres under cultivation, of which 189,703 were with wheat, and 2,577 with potatoes. The average yield

per acre throughout the colony is about $11\frac{1}{2}$ bushels of wheat, $16\frac{1}{2}$ bushels of barley, 20 bushels of oats, and $6\frac{1}{2}$ cwt. of potatoes. Wheat, which fetched 3s. 6d. and 3s. 10d. per bushel in 1850, was sold at 4s. 9d. to 7s. 9d. in 1858. Flour, which sold at £10 to £11 per ton, now realizes £14 to £17 15s. Instead of importing flour and grain Adelaide can now export largely, shipping 25,000 to 30,000 tons of flour and 36,000 quarters of wheat annually to the neighbouring colonies. There are 74 flour mills in the colony nearly all worked by steam, and 22 machine manufactories, although implements and machinery to the value of £35,000 are imported from the United Kingdom.

The superior quality of the grain of South Australia is well known. In 1858, the first prize was accorded to wheat grown on the hills weighing 68lbs. 11 oz. per bushel; and that which carried off the second prize weighed 67lbs. 10 oz. The best qualities grown on the plains weighed respectively 65lbs. 12 oz. and 65lbs. 7 oz. Prize barley grown on the plains weighed 55lbs. 14 oz. and 55lbs. 1 oz. We are somewhat surprised at the low average yield of wheat in the colony; for in Tasmania the average produce has been for some years from 19 to 21 bushels per acre; while on good farms the produce is double that quantity. By colonial law there the market-bushel of wheat is fixed at 60lbs. The best samples of South Australian wheat shown at the Exhibition in 1851 only weighed 64lbs. per bushel, and yet for perfection of growth the first place was accorded to it of all wheat exhibited, and it was remarked by well-informed judges, that, as regarded weight,

strength, and colour, it could not well be surpassed. The samples of wheat, barley, and oats, shown by Messrs. Heath and Burrows, and Messrs. R. Hallet and Sons, were nearly all equally matchless. The oats weighed 46lbs. the bushel, and the barley would have netted the highest price given for malting—34s.—if it could have been obtained in bulk.

The culture of the grape for the production of wine is a pursuit to which much attention is devoted, and that promises to be very productive. In 1860 there were 2,201 acres of vineyard, and upwards of 3,000,000 of vines planted, of which about half were in bearing; 180,324 gallons of wine were made in that year, besides 13,561 cwts. of grapes sold. The quantity of wine made shows an increase of 40,000 gallons over the preceding year.

Passing next to a consideration of the live-stock, we find a very rapid increase shown. In 1850, there were in the colony but 6,488 horses, 68,296 horned cattle, 897,866 sheep, and 1,297 goats. In 1858, the numbers were returned as follows: horses 34,629, horned cattle 375,507, sheep and lambs 3,108,501, and goats 2,339. The value of these has greatly increased. In 1850, sheep were worth but 6s. to 9s. per head; now they are worth 18s. to 21s. Working bullocks have trebled in price, fetching £10 to £13. Horses, which could then be bought for £15 to £30, have doubled in price.

As an agricultural colony, the facts and figures adduced prove that South Australia is progressing favourably and rapidly.

THE AMOUNT OF POWER APPLIED IN STEAM PLOUGHING.

“Blessed is he that expecteth nothing; for he shall not be disappointed.” This is a significant proverb, and in a limited sense applies to those sober and reasonable people who know better than to reject a present good thing because of some fancied hypothetical better thing in the future. We have shown why we consider that no very surprising advance upon the mechanical performance of our best steam ploughs is likely to be realized. There is a certain amount of resistance in the soil to be overcome—a certain amount of power applicable to the task of overcoming it; and the percentage of this motive-power already brought to bear upon the actual work of cutting and moving the ground is so large, that but little remains to be saved from waste in friction, inertia, and other sources of subtraction from the effective force of the motor employed. It is worth while to examine a little further into this question; and the judges’ report of Canterbury trials enable us to do so, though accurate experiments with dynamometers of adequate power yet remain for the Leeds meeting to supply. Fowler’s plough worked 4 furrows at once; what was the total draught? Busby’s iron plough showed the draught of a single furrow to be 49 stones; and deducting, say 12 stones for the draught of the plough empty (according

to many dynamometric experiments), we have 37 stones as the resistance of the work itself. Thus the resistance to Fowler’s four-furrow plough would be $(37 + 4)$ 148 stones. To this add the draught of the implement empty, which, judging by the draught of vehicles on similar wheels, should be about 20 or 22 stones, and we get 168, or probably 170 stones as the total draught of the plough.

We have said that dynamometric trials with common ploughs have demonstrated that about 12 stones’ draught is due to a plough when drawn along without doing any work, arising from the mere weight of the implement itself sledging on the furrow bottom. Confirmatory of the fact that supporting the weight of the plough-bodies in Fowler’s implement does lessen the draught due to each, we have the experiments tried by Mr. Halkett. For we are informed that he found the draught of a Howard’s plough in work to be 3 cwt. when drawn along resting upon its sole, but only 2 cwt. when suspended to his platform running upon the guide-way rails.

The pace travelled was 225 yards in $2\frac{1}{2}$ minutes, as noted by us at the time, though not named in the judges’ report. But by reckoning from the data of 2 rods 38 perches ploughed in 40 minutes, and the

breadth ploughed at once 42 inches, we find that 14 journeys or half-bouts must have been made; and allowing the observed time of $\frac{1}{4}$ to $\frac{1}{3}$ of a minute for turning at each end, we arrive at the same time of $2\frac{1}{2}$ minutes for the distance from end to end. This is at the speed of 270 feet per minute. Now, 170 stones' draught, at 270 feet per minute, is equivalent to 642,600 lbs. lifted one foot per minute; and as one horse-power equals 33,000 lbs. raised one foot per minute, the power represented must be $19\frac{1}{2}$ -horse power. As the engine was nominally of 12-horse power—that is, having two $7\frac{1}{2}$ -inch cylinders of 12-inch stroke—though worked up to 68 lbs. pressure per square-inch, instead of its normal pressure of 45 lbs., there is no such very great margin for increased percentage of duty actually engaged in the tilling.

Let us now look at the amount of power applied to the implement in the heavier-land trial up and down a steep hill. Three furrows were taken up hill and four down—that is, three-and-a-half furrows at once, an average of the whole-time. The draught of Busby's plough (average of up and down) was $95\frac{1}{2}$ stones; and, deducting 12 stones as the average draught empty (the less draught in descending compensating for the greater draught in ascending), we have $83\frac{1}{2}$ stones as the resistance of the work itself. Thus, Fowler's $32\frac{1}{2}$ furrows took a draught of $83\frac{1}{2} \times 3\frac{1}{2}$ about 292 stones. To this add—say, 22 stones as the average draught of the implement empty, and there will be 314 stones total average draught of the plough up-hill and down-hill. The length of furrow was 330 yards; the time occupied in the journey (as observed by ourselves), was 6 minutes in going down hill and $6\frac{1}{2}$ minutes in going up. The average pace, therefore, was 156 feet per minute. Now 314 stones' draught at 156 feet per minute is equivalent to 685,776 pounds lifted one foot per minute—thus representing $20\frac{3}{4}$ -horse power.

From this case, as from the other, it appears that the engine applied about 20-horse power to the implement.

The speed affects the proportion of power employed in simply moving the implement. In the first trial, with a pace of 270 feet per minute, the total power applied was $19\frac{1}{2}$ -horse power, of which $2\frac{1}{2}$ -horse power was for moving weight of plough; leaving 17-horse power effectively engaged, in the actual cutting and turning of the soil. In the next trial, with a pace of 156 feet per minute, the total power was $20\frac{3}{4}$ -horse power, of which only $1\frac{1}{2}$ -horse power was engaged in moving the weight of the plough, leaving $19\frac{1}{4}$ -horse power for the actual tillage. So that for economizing power, as well as for lessening the number of turnings at the end in a day's work (thus securing a greater number of hours in real work), the slower has an advantage over the quicker speed.

It will be observed, too, that the economy of working is proportioned to the amount of resistance met with in the operation. The implement may take $1\frac{1}{2}$ to $2\frac{1}{2}$ -horse power, according to pace, merely to move its own weight and the loss of power in working the rope; and the other parts of the apparatus also varies from a fixed quantity, according to the speed travelled—whatever may be the nature of the tillage being performed. That is, the power required to drive the whole machinery empty is least when the pace is slowest, as it is in doing the heaviest work. And hence, when the full force of the steam-engine is engaged, a much larger per-centage of the power is most effective in actual tillage than when the engine is performing an operation below her capability—such as ploughing light land when it could do heavy, or driving three furrows when it could manage four.

The amount of power applied to the haulage of the steam plough was about 20-horse power. What was the full amount of power given out by the engine? The judges make a general statement that the engine, with two $7\frac{1}{2}$ -inch cylinders 12-inch stroke, was driven at the rate of 140 revolutions per minute, with a pressure of 68 lbs. on the square inch—equivalent to a working-power of about $35\frac{1}{2}$ horses. This is the computed power, allowing 3-10ths lbs. for friction, &c., and supposing that the 68 lb. pressure per square inch was maintained upon the pistons uniformly throughout the whole stroke. But such calculations of the power of engines from a few minutes' observations of their speed, &c., is liable to considerable error; and it is not only unlikely that the 68 lbs. pressure was exerted through the whole length of stroke, but also unlikely that a pressure of fully 68 lbs. was maintained in the boiler without flagging, all the time the engine was at work. The gearing of the machine was so timed that the engine crank-shaft should make 130 revolutions for 264 feet advance of the plough; and as the plough travelled 270 feet per minute, the engine in the first trial must have made about 132 revolutions per minute on the average. From what we have said above, we are therefore inclined to estimate the power given off by the engine at that trial as under rather than over thirty-horse power. There would appear, then, to have been something like ten-horse power consumed in working the apparatus itself, while at such an excessively heavy task. In the farmer's hands, run at a lower pressure, the twelve-horse engine would probably give off about twenty-horse power effective, when, of course, both the amount of ploughing done and the deduction for the friction, &c., of the machinery and tackle would be alike reduced. We believe that the power consumed by the machinery itself has been greatly lessened by means of the new clipping drum and adoption of larger gearing; so that a larger percentage of duty is now got out of the engine.

BEEF, BUTTER, AND CHEESE.

How can we make more butter? is what they have just been considering in Ayrshire. How we may make better cheese is what they have been talking of in Hanover-square; and how we shall increase the supply of meat is what they have been discussing at the Central Club in Bridge-street. These three meetings have come appropriately enough within a week of each other, at a time when such topics are all alike especial objects of interest. They range high, with a still growing demand; and people who begin to despair of making their way with corn crops, are coming to look more directly to the pastures and the dairy. We are enabled in another page to report and deduce on the meeting in the North. As usual, we can give the Farmers' Club proceedings in full; but with the lecture in Hanover-square we can take no such liberty. No sooner had Professor Voëlcker delivered it, than Mr. Thompson, on the part of the Journal Committee, rose, with some evident anxiety; to enter a protest against the publication of Professor Simonds' address being regarded as a precedent. The proper and only place for the appearance of these lectures was in the pages of the *Journal*, and such a right must not be anticipated.

Whatever may come of this protest hereafter, it was in the present case one of no great moment. Professor Voëlcker's speech on the manufacture of cheese was in a great degree but an introduction; or, as he himself admitted, altogether incomplete, without another morning or two devoted to the same theme. Hence its publication might be premature; although we may venture to glance at the manner in which the art is so far treated by science, as in contradistinction to practice. We may say, then, at once that the subject was very ably handled—clearly, with great care and research, accompanied with a certain degree of boldness when the lecturer's own opinions ran counter to those that long usage has stamped with its imprimatur. Never offensively or derisively put, as is too commonly the case when the student comes to criticise the workman, Mr. Voëlcker's own confidence found a ready sympathy with his audience; and rarely have new theories been more reasonably offered, or better received.

The opening fact was a suggestive one, as showing how greatly some further aid and advice was required. The manufacture of cheese, or, ergo, cheese itself, is not so good now as it was five-and-twenty years since. And the Professor attributes this decline not to the use of bones nor the decay of our pastures, but to the echo of a want we have uttered—that of a good dairy-maid. In days gone by the farmer's wife herself, if not, as she frequently was, her own dairy-woman, had still an especial pride in its management. Now, however, she leaves such a part of the business of the farm more and more to her servants, and, as a consequence, with less care and cleanliness in its conduct. And cleanliness is above all things the first great golden rule of the art. The Professor dwelt on this at some length, demonstrating how the cheese might be utterly spoiled even before it was made—how painted pans and tubs should be avoided, as not to be trusted when washed with scalding water—though they do paint them in Cheshire—and so on. Then ignorance is often associated with idleness, while even where good cheese is yet manufactured the dairywoman will be able to offer but little showing for what she does. Happy accident

or established habit are her great landmarks; and it is here science tells very effectively in demonstrating directions for difference of temperature under different circumstances—preventives against cheese becoming sour—how it should be coloured—and other points that the Professor will put in his own way. We may, however, venture to give some of the different degrees of temperature, as laid down with all the distinct emphasis of line and rule:—At below 70° the curd remains soft and tender, at 60° it takes 3 hours to rise, at 65° 2 hours, at from 70° to 72° $\frac{1}{2}$ to $\frac{3}{4}$ of an hour, at 90° a $\frac{1}{4}$ of an hour—at 120° it runs "like toasted cheese." Thin cheese is spoiled at a high temperature; and, in Cheddar cheese the curd rises at the temperature of 80° to 84°. After the whey is separated you may raise the temperature from 95° to 100°, but not higher. Milk coagulates at any temperature, from 60° to 130°, but at 135° it ceases. Mr. Voëlcker illustrated his discourse with a number of useful tables, showing the composition of different sorts of cheese, that no doubt will be published with the paper; while he was continually sending round samples of strong and mild, old and new, good and bad, for the yet more practical ordeal of touch, taste, and smell. But, alas for such advantages! there were scarcely twenty people present, and the majority of these were lords and landlords who had come on the business of an adjourned Council Meeting. But, we may add, for the benefit of the outside world, on the authority of Professor Voëlcker, that it is a mistake to suppose cheese will only "grow" in certain places; it may, on the contrary, be made on any description of land.—That for such a purpose bones improve all lands.—That food does not influence the flavour of the cheese so much as the different systems of manipulation.—That milk varies greatly in analysis, while it soon becomes tainted when the dairy is placed near to drains, pig-styes, or cesspools, and that cheese-making under such circumstances is labour lost.—That milk should not be "soured" before the process of cheese-making begins, and that acidimeters are of little use.—That the Cheshire plan of making the rennet day by day is not necessary, and the custom of the same district of keeping the cheese-room dark, close, and confined, is altogether reprehensible. The store-house must be thoroughly well ventilated, or the quality of the cheese must suffer. It is a wholesome sign to see a thinking and a careful man like the Professor attacking *mos pro lege* as strongly as we have intimated.

At the next meeting we are promised something under the equally important heads of "food for dairy cattle," and "the best breeds for dairy purposes." But here Mr. Voëlcker allowed he was not so well armed, at least not when at home. "At Cirencester our stock are *too well bred to give much milk*: the mongrels are the best for that;" and hence his experiments upon the herd have not been very encouraging. This forcibly reminds one of the capital story of the tenant of the late Lord Leicester had, in compliance with the wish of his landlord, himself partial to the North Devons, obtained a dairy of cows of that breed of the purest type. The then Mr. Coke was so proud of these that he frequently took his friends staying at Holkham to view them. On one occasion he went with a nobleman, who, after seeing and duly admiring the stock, thus ad-

dressed the owner:—"Your cows," said he, "are very beautiful; but why do you keep those ugly polled Suffolk brutes among them? they quite spoil the dairy." "Ah! my lord," bluntly replied the farmer; "these fine cattle are all very well for show, but you see, after all, *we must have a little milk for the family!*" The name of the tenant was Mr. Purday, of Egmore; while another of the Holkham tenants, Mr. Hudson, of Castle Acre, at the Farmers' Club, on Monday, could not refrain from another fling at "the dainty little Devons." Still here the best breeds go rather with Mr. Owen Wallis, more for meat than milk; and it is curious to see by what different means we arrive at different objects. Mr. Wallis, after complaining of the way in which that admirable butcher's beast, the North Wales Runt, has been suffered to deteriorate, refers to "another matter requiring great change, and that is the use of better bulls in the dairy districts. Too many

of the owners of dairy herds care nothing about the bulls they use, so long as their cows are only in-calf at the proper season, and many of their bulls are of the most ordinary character. The calves so bred are bought by dealers, and sold by them for rearing; and the result is very often a very mongrel kind of shorthorn." There is much, in fact, to compare and collate in the two, or rather the three meetings we have mentioned. Mr. Wallis has some remarks on the use of bones, for instance, but still somewhat antagonistic in their tone as to meat *versus* milk. Other speakers, again, like Mr. Hudson and Mr. Fisher Hobbs, touched on the merits of our different breeds of stock, though these again must be read with all due consideration of time and place. It is, in a word, a division of two to one. At Ayr and in Hanover Square they declare for butter and cheese, and in Bridge Street for beef—ends, as it would seem, to be obtained by very different means.

LONDON, OR CENTRAL FARMERS' CLUB.

THE FEEDING OF STOCK.

The usual Monthly Meeting of the Club took place on Monday, May 6, at the Club House, Blackfriars. Mr. SKELTON in the Chair, when there was a very good attendance of members. The subject for discussion, assigned for introduction to Mr. Owen Wallis, of Overstone Grange, Northampton, was—"By what means can the Feeding of Stock on Pasture-land in Spring, Summer, and Autumn be so increased as to supply the demand of an increasing population?"

"After a few opening remarks from the chairman,

Mr. OWEN WALLIS said: The subject for discussion this evening is, I think, one of very great importance, not only to agriculturists, but to the community generally. It involves considerations which seriously affect the comfort and well-being of the labouring and all other classes, for the physical energies of the working man cannot be sustained in their full vigour without a proper allowance of animal food. With a population rapidly increasing in numbers, and happily also in material prosperity, the demand for meat has increased to a wonderful extent. That the supply has not kept pace with the demand is, I think, apparent, from the increased price which it has attained. That the supply is very much greater than it was some twenty or thirty years since, cannot be doubted; but still the consumptive powers of the people have increased in a much greater ratio. It is, in my opinion, much to be regretted that we have no means of ascertaining, even approximately, the extent of our increased supplies. We are at great pains and expense in finding out the rate at which the people increase in numbers, but take no thought as to the extent to which an article of food essentially necessary to their proper existence has also increased. It is here that we feel the want of a simple system of agricultural statistics. I do not attach any very great importance to them in other respects, but I think they are very desirable as a measure of our progress. With many branches of our great manufacturing interests greatly, but I trust only temporarily depressed, and the consumptive powers of the working classes consequently lessened, the price of meat is higher than at any period since the close of the French war. With a return of prosperity, full employment, and good wages, we may reasonably suppose that the demand will be much greater than it is at the present time; and unless there is an increased supply, prices must necessarily range even higher than they have yet

done. It is necessary, therefore, to see in what way, and to what extent, the quantity of meat can be increased. With few exceptions, all but the most worthless soils have been brought into cultivation. We cannot, therefore, very greatly extend the area of production. We must, then, endeavour to produce more upon those acres at present at our command. The chief exceptions are the woodlands of England. That they are not now a productive property is pretty generally admitted. Large portions of them would, if cleared, thoroughly drained, and well cultivated, make excellent corn land. The use of timber of British growth has been greatly superseded by the use of iron and foreign timber; thus rendering the continued growth of the former less necessary. This may be thought irrelevant; but every addition to our arable soils is necessarily followed by an increased production of cattle, sheep, and pigs, and is, therefore, not an unimportant feature in the future supply of meat. It is, however, by the extension of our artificial pastures, the improvement of our permanent ones, and by calling to our aid the use of cake, meal, and other food, in conjunction with them, that we must look for the chief increase in the supply at those periods of the year to which our subject chiefly has reference. That the improvement in the productive powers of our pastures has not kept pace with that of our arable land, is only too apparent. Indeed, the latter has very commonly been manured at the expense of the former. It is true that the practice which formerly prevailed of folding sheep nightly on arable land, that had been grazed during the day on pasture land, is now much less common. That, however, is mainly owing to the fact that the pastures so used became so worthless that they would no longer support a sufficient number of sheep to make folding from them practicable, much less profitable. These exhausted pastures were therefore ploughed up, and converted into permanent arable soils. But where folding has not been practised, and a less exhausting system adopted, still most of the hay grown on old pastures, and consumed on farms of a mixed character, has found its way, when converted into manure, not to the land which produced it, and which was fully entitled to it, but to the arable portion of the farm. Much of the pasture land has been drained—some of it effectually, more of it only partially—and it has otherwise been improved by the removal of ant-hills and hassocks. Those, however, who have ridden over the country during the past winter

know full well that more requires draining than has already been drained. There is, I know, some degree of prejudice against the draining of pasture land, and it is not uncommon to hear that practice deprecated. To this circumstance we may possibly attribute the non-drainage of a portion of those lands. It is, in my opinion, a great error, and has its origin in the circumstance that pastures do, for a time, occasionally wear a worse appearance, and carry less stock, than before draining was effected. But this is very easily accounted for, and is in reality no valid reason against the ultimate benefits of good drainage. We all know that stagnant water produces and supports a coarse herbage, and is destructive to the finest and most valuable grasses. Having taken out the water which is essential to the support of the coarse grass, and sufficient time not having elapsed for the reproduction of the finer ones, it is no great wonder that temporary disappointment is the result. In the end, however, the drainage is highly beneficial, and the outlay profitable. In my experience, I can safely aver, that I have never yet seen an instance to the contrary. There are some soils naturally so tender, that no amount of draining will make them otherwise; and as they produce only the finest and most feeding herbage, it is folly to attempt it. It is only necessary to keep the cattle off them in wet seasons. But, supposing that some portion of the pasture land has been fairly dealt with, and that all the excrementitious matter which belonged to it has been returned to it, still waste and deterioration may be going on by the yearly abstraction from the soil of phosphates and other substances. Where land is used for dairy purposes, this is unquestionably the case. Hence the marked benefits which the use of bones has caused on the dairy lands of Cheshire and other districts. To the above-named causes, I think I am justified in assigning the great injury done to some portions of the grass lands, and the partial deterioration of others. I am acquainted with a good deal of land that has the reputation of having been, many years since, much better than it is at the present time. Some fields are spoken of as having fed off two lots of beasts in a season, that now will scarcely make one lot fat. It is owing to this deterioration, and the consequent unprofitableness of many of the old pastures, that many of them were broken up. This has been one of the chief causes of the lessened supply of live stock. Another cause may be found in the substitution of the four-course rotation of husbandry, for the six-course. I recollect when the artificial grasses were very generally grazed two years, and some even three. There was, therefore, one-third of the light arable soils on farms so managed in pasture; and a much greater number of cattle and sheep were then kept upon them, than there are at the present day. I have, on former occasions, when addressing the members of this club, advocated a return to the six-course rotation; and the increased value of both store and fat stock is an additional reason for its adoption. I have long been of opinion that more stock may be produced, and more corn grown at a less cost, by that system than by any other. An increased supply of young cattle is now of the first importance. Until it is produced, of course it cannot be fed, and we must look to the arable soils for a portion of that increase. At present, by the great extension of winter feeding, they abstract very largely from the supplies of the summer grazier. No one can regret this, because stock feeding is the life and soul of good husbandry; but it causes the price of store cattle to rule so high, that even with the present price of meat, those purchased now can scarcely leave a profit to the feeder. Breeding has generally, for many years past, when combined with feeding, been the most profitable part of the business. More than twenty

years since, when the late Lord Spencer (the uncle of the present Earl) endeavoured to persuade the farmers of Northamptonshire to turn their attention more to breeding their own cattle, he gave as a very cogent reason for their doing so, that his own home-bred steers paid him more per week from the time they were calved, to the time they were sold as fat ones, than the cattle he bought for grazing did for the last six months they were feeding. The inducement to breed is much greater now than it was then, and it should be extended wherever practicable. It is, moreover, highly important that the cattle which prevail in some districts should be greatly improved. This is especially the case with respect to North Wales. There is no more useful class of beast than a good Welsh runt; but many of them are so inferior, and require so much fattening, that they are much less profitable than they ought to be, or need to be. This is owing to the suicidal practice of the breeders, who sell all their best heifers to come to England to be fed, and keep only their worst ones to breed from. It seems useless to offer advice to men who can be capable of such folly; but they may be quite certain that much the largest portion of the cattle they breed would command much higher relative prices if they were to adopt the very contrary course, and breed only from the best males and females they can obtain. The cattle of South Wales are getting more into favour than the North, owing to their greater aptitude to fatten; but many of them are very light of flesh, and require great improvement in that respect. Another matter requiring great change, is the use of better bulls in the dairy districts. Too many of the owners of dairy herds care nothing about the bulls they use, so long as their cows are only in-calf at the proper season, and many of their bulls are of the most ordinary character. The calves so bred are bought by dealers, and sold by them for rearing; and the result is very often a very mongrel kind of shorthorn. Numbers of these calves have been sent to Ireland to be reared, and kept there till they are two or three years old. They are then sent back for the benefit of the English grazier. While speaking of Irish cattle, I will mention, incidentally, the very objectionable treatment they receive on the passage to England. I was once at Holyhead when cattle were being unloaded from a steam vessel. They had been crowded one tier above another in the hold of the ship, and the stench from them was perfectly unbearable. After having been kept in this foul atmosphere during the voyage, and steaming with perspiration, a rope was looped round their bodies with a running noose, and hooked to the crane by which they were drawn on deck. The effect of the rope, drawn by their whole weight tightly round their flanks and chest, was not only to force their intestines into their lungs, but also to compress their ribs with great force upon the lungs. After this treatment on board, they were driven to a bleak hill side, till such time as they could be loaded in railway waggons, and forwarded to England. They were conveyed at great speed through the cold air; and with their skins still wet, we can easily imagine the chill they would get, and need not be surprised if, from these combined causes, diseased lungs were the result. From what I saw on that occasion, I have had no difficulty in accounting for the losses sustained amongst them. I have myself participated rather heavily in those losses, not only with respect to the Irish cattle, but also in others infected by them, and dare not now venture to purchase them. I need scarcely add that these losses recoil upon the producers of the cattle, as they are purchased at prices commensurate with the risks. This may be thought a digression from the

subject, but anything that has a tendency to produce disease in cattle has also a tendency to raise the price. Another cause of the high price of cattle is the very imperfect manner in which too many of them are now fed. We give a very high price for what may be termed the raw material, and then waste a large portion of it. It is, in my opinion, a positive waste to send thousands of young beasts annually to be slaughtered that are barely in a half-fat state. This, however, is commonly done in the autumn of each year. These beasts are now grazed at so early an age that common pasturage alone does little more than support their growth; they are consequently unfit for the fat-stock markets, and ought to be sent, if sold they must be, to the markets for store cattle. Thousands of them having attained maturity, would make really fair good beasts if kept another year, and are worth much more to keep than to sell. In order to get an opinion on which reliance can be placed as to this point, I wrote to Mr. William Collins, who, as most of you are aware, is a cattle-salesman of great experience in the metropolitan markets, asking him what, according to his judgment, would be the increased weight of the cattle sent to market during the grass season, provided those sent were really and fairly in a fit state for slaughtering. His reply is, that they would, with only a little additional feeding, weigh, on an average, ten stones per head more than they do now. He estimates the average weight of those sent to market from the 1st of July to the end of November at eighty-two stones, of 8lbs. to the stone. The increase, therefore, of only ten stones each would give a large additional percentage to our present supplies. He states that other salesmen, whose opinions he asked, estimate the grass-fed beasts for the above period at only seventy-six stones. From the above evidence it is quite clear that a very large portion of the cattle at present sent to market are very insufficiently fed; and we have now to consider in what way the defect can be remedied. I have already hinted that it is by the use of cake, and other artificial food, in conjunction with summer grazing, that we must look for a greater supply of really well-fed beasts, and the gradual, but permanent enrichment of our pasture lands. I am rather diffident in recommending its extensive use, knowing that cautious men will be slow to adopt it. There are many who will use both artificial food and manure to any reasonable extent on arable land, when it is immediately available, and can soon be exhausted, who will be rather shy in using either on permanent pasture; which, when once enriched by the tenant, remains for the future benefit of the landlord. But, if we can adopt this system with profit to ourselves, it will be a very foolish and selfish policy to abstain from its use, because we are increasing the value of our landlord's freehold. That there are some wanting in means and principle, or deficient in both, who would be ready to take advantage of a tenant's capital so expended, is probably true; but such cases are, happily, the exceptions, and not the rule. The great majority of landlords are sufficiently men of business to see how much it is to their interest to deal liberally by and encourage improving tenants, and are gentlemen of too high principle to take advantage of confidence reposed in them. But before cake or meal can be extensively used on pasture land, proper accommodation must be provided, and arrangements made for the purpose. Among other things, the large fields must be divided, for it would be impossible to give either to a great number of beasts in one field; for before the whole could be given out, the first portions would be eaten, and the master beasts would then disturb the weaker ones, and rob them of their fair share of the food. The consequences would necessarily be, that some would get too much, and others none. I consider there should

not be more than fifteen beasts together, but certainly twenty ought not to be exceeded. Indeed, the smaller the lots, the better they will do. Moreover, on moderately small fields, irrespective of artificial food, a higher per-centage of cattle can be grazed, and consequently more meat can be produced per acre. This is owing to the circumstance, that in small fields the land is of a more uniform character, and grazes evenly; whereas, in large ones, some parts are eaten closely, while others get coarse. Cake can be given in small boxes set about the grass, giving a box to each beast. Some persons think boxes unnecessary, and give it on the ground; but I cannot but think that some of it must be wasted, and prefer to use boxes. If given on the ground, it should not be broken too small, and the dust should be screened out of it, and given to sheep. Mr. Hudson, of Castle Acre, informs me that he gave it in this way, and that by throwing it on the roughest parts of the pastures, the cattle eat up the coarse grass very barely, in consequence of the particles of cake which adhered to it. There is this great advantage in this plan, that it can be adopted at any time, and almost under any circumstances. But to carry out the system in the most efficient manner, there should be hovels in the fields, suitable for the accommodation of the number of beasts they will graze. I am quite of opinion that hovels are quite as much needed for shade in summer, as they are for shelter in winter. We all know how much cattle often sink in hot weather in consequence of racing about the fields when gadding. If they were tied up in sheds during that time, and fed with a portion of either cake or meal, and a small quantity of either good hay or chaff given to them, this waste would not only be prevented, but they would be rapidly gaining flesh. I am of opinion that under no circumstances can cake, meal, or hay be given with greater benefit than those I have described. As to the most suitable sheds, I am of opinion that those with low-slatted roofs are the most costly, and also the worst. They are intensely hot in summer, and cold in winter, two faults most desirable to avoid. I should greatly prefer to have them either well-coated with thatch, or covered with thorn or gorse faggots, and sufficiently thatched to keep the wood dry. Good wide mangers are necessary in order that they may be used for either cake or hay. With respect to the number of beasts that individuals should have at artificial food at one time, that of course will depend upon the extent of their occupation, and other circumstances. One of the main objects gained would be the equalization of the supplies. Now, at the close of the Norfolk season, there are but few grass-fed beasts ready for market, and beef is very scarce; whereas in October and November many more beasts are sent for sale than there is a demand for; and many are sold very badly, and pay little or nothing for grazing. If, however, a portion were got into a forward state during the winter, and were kept improving, in the way I have described, they would be ready for market when wanted. As they are sent away, others that are in the most forward state should take their places; and these, when ready, should go, to make room for others. By this arrangement, no one lot of beasts would be at expensive food so long as to cause too great an outlay upon them. This part of the feeding process should not exceed six, or at most eight weeks; and that, with beasts sufficiently advanced, would be ample to finish them. I would by no means recommend its adoption with respect to lean cattle. That can only be productive of loss. As to whether cake or barley, bean, or other meal is most suitable, in conjunction with grass, will depend upon their relative values, and also

upon the state of the grass. When that is in a very succulent state, straw or hay-chaff and meal would be the best corrective; whereas in hot weather, when the pastures are in a dry state, cake and hay might be given. These, however, are matters on which the feeder must necessarily exercise his own judgment. Mr. Oakley, of Lawrence End, Herts, informs me that he has used the meal of Egyptian beans very successfully. He gives it with straw-chaff cut very fine. By pursuing this plan, and by the improvement to the pasture resulting from it, he now feeds upon the same land more than double the number of cattle that he did formerly, notwithstanding they are put into the yards at night, and thus take some of the manure from the pasture. It may be argued that land treated as I have recommended would soon become too much manured. When that occurs, other fields should be selected, and the over-manured ones mown for a time. Besides, the manure collected in the sheds, and that gathered in the fields where laid too thickly, might be applied to the fields usually mown, or to the store pastures. It will be long before any great difficulty arises on this point. I am not enough of a chemist to be able to say whether feeding of cattle in the way I have described will of itself be sufficient to renovate our old pastures. Should lime, superphosphate, or other applications be necessary, our agricultural chemists will enlighten us on the subject, and the manufacturers of manure supply the necessary stimulant. There is only one other point on which I need trouble you: that relates to the practice of soiling cattle. On arable farms with artificial grasses, or with water-meadows that can be flooded at pleasure, and a regular supply of grass depended upon, this practice may answer. On old upland pasture I doubt its being at all successful. It is generally so late in the season before it is fit to mow; and, when it is so, it would so soon outgrow the wants of the cattle; and with variable seasons also it would be next to impossible so to regulate the supply of cut grass as to suit the demand. Moreover, this system on a large scale would require an amount of both cattle and labour much beyond the present supply of either, and would on that ground alone be impracticable. As to the quantity of cake it is desirable to give, I commence with 4lbs. per day, and finish with 6lbs., giving on an average 5lbs. per day. If this is continued for six weeks it will amount to 15 stones per head, which, at about the average price of cake during the summer, will not exceed 20s. We know from our experience that between a ripe bullock and one that is not well up to the mark, there is commonly a difference of more than double that sum in their respective prices, supposing they are equal in size. If, therefore, by an outlay of £1 we receive £2, the investment is a profitable one. But supposing it to be rather less than this, we must not forget the extra number of beasts that can be so fed on the same quantity of land; and the rent, rates, and taxes being the same in both cases, a further additional profit is thus obtained, to say nothing of the rapid improvement of the soil. I have not thought it necessary to go into the question of sheep-feeding, that being too well understood to require discussion on the present occasion. In conclusion I have only to remark that I am quite sensible I have nothing new to offer for your adoption. I have ventured, however, to recommend to the graziers of England a much more extended use of a practice now only carried out in isolated cases, and on a very small scale; feeling assured that the time has arrived when we can no more depend upon grass alone for our supplies of beef during the grass season, than we do upon roots alone during the Norfolk season. In short, we must adapt the practice of winter feeding to our old pastures, with such modifications as the circumstances require.

Mr. HUDSON (Castle Acre) said he had but a few observations to offer on the subject contained in the excellent paper just read by Mr. Wallis. He might be mistaken, but he had understood Mr. Wallis to recommend that the dust of cake should be given to sheep. He (Mr. Hudson) preferred that the dust should be given to the cattle with cut hay in boxes; for having used a great deal of cake for sheep, he thought it desirable that they should have as little dust as possible. They would not touch the dust, but they would eat the cake in pieces the size of a hazel-nut. Cattle would eat it with cut hay, but sheep would refuse it. He agreed in almost everything that was stated in Mr. Wallis's essay, and he thought that, considering the large demands that were made on the feeders of cattle in this country, they could not keep pace with the consumption unless something new was discovered for summer feeding, and he did not think of anything that would supply the market better than a little additional food in the shape of cake when the cattle were at grass. Many persons, he was aware, objected to that; he not only consumed a great deal of cake in the winter season, but had no objection to consume it in summer also. He had done it for many years, and had experienced the benefit of the practice. His cattle were always then ready, one lot to take the place of another, as they came ready for market. He believed also that it had the effect of improving the pasture-land, whilst the system of feeding on pasture and folding on arable land during the night robbed Peter to pay Paul.

The CHAIRMAN: Can you give us any idea of the breed of cattle best fitted for the purpose?

Mr. HUDSON: The best of every breed (Hear, hear.) Why feed bad cattle? (Hear, hear.) Only last week he had enjoyed a great treat. He had been through several herds of Shorthorned cattle in a district in Wiltshire that he visited eight or ten years ago, and the improvement that had since taken place was perfectly marvellous. The cattle he had seen there were such as would do credit to any county in England; and he could name the owners, but that perhaps would be invidious. The Shorthorned cattle were decidedly the cattle with which to feed the people of England. True, they might better please the pampered palate of the rich by the Highland Scot, or the beautiful little Devon; but the million wanted a heavier class of cattle, and the million were the farmers' best customers (Hear, hear.) As long as they could earn plenty of money they would have beef, and they ought to have plenty of it.

The CHAIRMAN: Have you considered the relative value of sheep and cattle?

Mr. HUDSON: Well, there were certain districts that would feed sheep, which were not calculated to feed cattle; and Norfolk men were under great obligations to Hampshire men for keeping up a very useful class of sheep—a sheep that suited their purposes particularly by being used with the Cotswold ram. There they had the very sheep to make meat for the million. Indeed, he believed they were the most profitable sheep that we could have. They could not be bred to a very large extent in his county, but he was too happy to send his men into Hampshire and Wiltshire to buy the class of sheep which was now breeding there from the large Hampshire ewes crossed by the Cotswold ram. At twelve or thirteen months old they would give as much as 20lbs. or 25lbs. of mutton per quarter, and 7½lbs. or 8lbs. of wool of the description which manufacturers most wanted to be grown, and which was the most useful to them.

Mr. LITTLE (Landhill, Wilts) agreed that Mr. Wallis had given them an excellent paper of a highly practical character, for which he begged to express his indebtedness. He observed that Mr. Wallis declined to recommend the use of oil-

cake or meal by breeding stock. Now he (Mr. Little) was not a grazier, and never had been to any great extent; but he had reared young stock from time to time on inferior pasture lands, and had found that by the use of oilcake and other artificial food the land had been improved in quality, and had enabled him to increase the quantity of stock by nearly one-half. He thought, therefore, it was as well to adopt an artificial mode of feeding, and thus increase the number of animals, which as they became older got into the hands of the grazier. This practice has been carried out, not only upon his own farm, but on others, and he thought that the inferior pastures of the country might be greatly improved by means of artificial manures in other counties as well as Cheshire. In that county pastures had been brought from very poor into very high condition by the application of bones. As Mr. Wallis had told them, enormous sums of money were expended in artificial manures on arable lands where a quick and immediate return could be made; but he agreed with him that the use of artificial manures on pasture land was quite as profitable as on arable, when time was given for their development. One instance which he might cite was that at Wall's Court, in the neighbourhood of Bristol, which had been held by Mr. Procter. He (Mr. Little) was engaged to survey the property for that gentleman when he took it of the Duke of Beaufort, and observed that together with improved drainage a large quantity of artificial manure was used, and the result was surprising. Perhaps there was no pasture-land in England upon which so great a change had been wrought as upon that particular farm, the means resorted to having been draining and the use of bones especially in a prepared state. Other parties in that neighbourhood had adopted the same course, and great improvement had been effected in the pastures, and a great increase of the stock kept thereon. This related more to the old pastures; but there were also many new pastures upon which he believed the system would be found equally effective. On all drained pasture lands an increase of manure was required to supply the wants of the plants, to give them food and increase the quantity; but that was generally overlooked, as had been remarked by Mr. Wallis. Mr. Procter's system was, after draining, to add artificial manures, and to feed his beasts with large quantities of cake, and he (Mr. Little) was certain that there was no one who had seen that gentleman's land but would approve of the system. The pastures of this farm were of the very poorest description, but were so much improved by Mr. Procter, that on relinquishing it (which from ill health he was compelled to do), it was taken by Mr. R. Stratton, and the Broad Hinton herd of Shorthorns are now grazing there.

Mr. T. CONGREVE (Rugby) said that he differed from Mr. Wallis, when that gentleman stated that he did not commend the use of cake for store animals. He was of opinion that cake was as valuable for store as for feeding animals, every bit (Hear, hear). In fact, the principal use which he himself and his friends the graziers made of cake, was to give it to the former in the straw yard. Instead of giving them hay, turnips, and so forth, which was wanted for the more forward stock and sheep, he gave them three, four, or five pounds of cake in the straw yard, and it answered as well in that way as in any other.

Mr. WALLIS: You quite misunderstood me.

Mr. CONGREVE: Well, that was one principal use of cake. It improved the manure, and kept the store cattle in a going-on state, ready for the application of the system which Mr. Wallis had recommended, and in which he entirely agreed with him. He believed the time would come when farmers would be obliged to use their store pastures as feeding pastures. He

knew several gentlemen in his own neighbourhood, who did so already. They put a bullock upon two acres, gave him 4 lbs. of cake upon the store land, and sent him to market in July; whereas those who were upon the good land, did not go until September.

The CHAIRMAN: Do they drain grass land in your neighbourhood?

Mr. CONGREVE: Yes; it was principally drained, and some perhaps a little too much so. There was no doubt that ploughed land could not be drained too much, but that pasture land could; indeed, he knew some drained land which could not maintain the same quantity of beasts that it did when it was undrained (Hear, hear).

Mr. W. SHAW (Northampton) said his friend Mr. O. Wallis had had so much experience in the use of cake in feeding cattle, both on plough and grass land, that he was quite sure any one would have great difficulty in questioning anything he had laid down. For his own part, having for years brought out his early-fed cattle on grass with the assistance of cake, the difficulty he had encountered in its use was this: for want of shelter the cattle were frequently running about in mid-day at the rate of ten miles an hour, when they ought to be quietly resting under sheds or in yards. It mattered not, therefore, what they were given until they were provided with good hovels, for a hovel was of as much value in summer as in winter (Hear, hear); and unless the large grazing fields were reduced in proportion to the quality of the land, he did not think they would ever realize the full value of the animals. It was wholly different to arable land, where the fields could not be laid too open; but in grazing he was not an advocate for too many beasts lying together. He believed it was of little or no use to try to feed beasts as they ought to be fed, and not go to market half-fat, until the grass land was brought to its full value by subdividing it and providing hovels. He had gone fully into the use of cake on grass lands, and he had found it to be absolutely necessary to have hovels and sheds, so as to completely develop the results of hay and cake. Mr. Congreve had reminded him that he might also touch upon the large amount of money they were expending on grass land in proportion to the return, and that leases would conduce materially to success. He was bound to say, however, that in Northamptonshire they occupied land which descended from father to son; he could not, therefore, so far as that county was concerned, see that leases would be of the same value as in other parts of the country. If a good sound tenant-right, as was evidenced by the practice in Lincolnshire, was generally established, it would assist in drawing out the resources of grass land as well as plough; but he did not think that the system of holding land was any barrier to their using cake in summer for feeding their cattle with.

Mr. RAMSAY (Newcastle-on-Tyne), after speaking in terms of commendation of the paper read by Mr. Wallis, alluded to the subject of draining grass lands, of which there were few who did not approve, although perhaps it might not be applicable to all descriptions of soil (Hear, hear). Drainage, he observed, would never have come into play but for the great and growing demand for food for the people. He then discussed at some length the question of supply and demand, and said that the point at issue was, not exactly whether a few pounds of cake more or less should be used, but whether they were deriving a fair rate of profit from the large amount of capital which was embarked in agriculture. Prices were of course depreciated at times, and there was no branch of trade or commerce that did not experience vicissitudes. They could not lay down any rules by which meat should be 8d. or 9d. per lb., which indeed was far too high a price for the work-

ing classes, who constituted the great body of consumers; and he did not believe the feeder got a fair profit by it, when obtained by means of oilcake, and other high-priced artificial food. In his opinion the great improvements which had been effected of late years in the various breeds of sheep had done more to increase the productive power of the country in animal food, than even the improvements introduced in cattle themselves. So far as he could gather, there was no comparison between the two. He did not think they could lay down any strict rules with regard to breeding and feeding of cattle. He himself was a shorthorn breeder, and had recently sent a lot to California, where they said no other description of cattle was fit to eat (a laugh). He was sure that the grass lands of the country might be improved by the application of artificial manures, and of all such manures none did so much good as bone manure in increasing the production of meat for the people. Its value had been proved in the case of milk; and if it gave more and better milk, it must of course create more and better blood.

Mr. BRADSHAW (Knole, Guildford) said the subject on the card was confined to a very limited sphere; it was, as he understood it, the larger increase of animal food from the improved condition of the pastures of this country. He had had many years' experience on the land of Cheshire. He recollected seeing at Henbury, on a farm belonging to a friend of his, Major Marsden, effects produced with bone in the course of eighteen months which were quite wonderful. Thirty-five years ago, on his own father's farm in Lancashire, he saw bones applied to the extent of three tons per acre, the price at which they were obtained in Liverpool being very low. In Surrey, where an impression prevailed that bones were of great value, he applied them to his grass lands, and found no great result. The greatest improvement made in pasture lands was, he thought, effected by folding sheep with mangel wurzel or swedes. If a little cake was given so much the better. He had 150 acres of grass land, which he intended to improve in that manner. He agreed with Mr. Owen Wallis, that cake judiciously given to bullocks would produce very valuable effects on land, if the droppings of the bullocks were properly disposed of. He had no doubt of the capacity of this country to produce sufficient animal food to supply the growing wants of the people. They might rely upon it that adequate means of doing that would be found. However, that was a vast subject, and he would not attempt to enter into it. No doubt when the cultivation of land was discussed at some future period they would all have had a little more experience with regard to steam, and many might have become converts who were now opposed to it.

Mr. FISHER HOBBS (Essex) agreed with the preceding speaker, that the subject for discussion was very limited, being simply the improved management of grass lands, with the view of meeting the demands of an increasing population (Hear, hear). He would endeavour to confine himself to that point. Therefore he would not enter into the subject of wood lands, which had been mentioned as one means of increasing the acreage of the country; or of that connected with the question of artificial grasses. He thought the main points for consideration that evening were, first, the improvement of the permanent pastures of the country; secondly, the improved breeding of animals; and, thirdly, the best and most expeditious means of preparing the animals for the consumption of the people. Now he thought it might be laid down as a fundamental rule, that upon grass lands, as well as upon arable, drainage was a necessity (Hear, hear). He could not agree with the gentleman who said that evening that they might drain their grass lands too much. There

might be some porous soils which, if the water were extracted, would not nourish those watery plants on which animals were fed. Hence the land might for a time appear to have been impoverished; but if grass lands were thoroughly drained, broken up, and laid down for pasture, an improved quality of grass would soon show itself, and land which had previously only kept stock in existence, would serve for the general purposes of stock-feeding. As regarded the improvement of grass lands, he concurred in the opinion that the use of oilcake was a very good means of carrying out that object. He had, like many other gentlemen, seen land doubled, and more than doubled, in value in consequence of oilcake to a fair extent having been given to beasts during the summer months. He knew many pastures in this country which would at one time scarcely maintain a fair amount of store stock; oilcake, however, having been used, it was found that animals fed with grass fattened very well, and within five years at least ten per cent. more animals were fattened upon those very pastures. He was persuaded that oilcake was a simple and comparatively inexpensive mode of improving the grass lands of this country, and of making lands which were previously store pastures, with good management fattening pastures. He was sure that many graziers would bear him out in this opinion. Still there were many things to be considered with regard to oilcake. It was very expensive, and it had become very difficult to purchase it in a genuine state; and it behoved all farmers to take every possible precaution in order that they might obtain a pure article (Hear, hear). Now, with regard to the breeding of animals, they could not possibly do better than follow the advice of Mr. Hudson, by breeding the very best (Hear, hear). Whether their animals were Shorthorns, or Herefords, or Devons, much depended on the soil and climate, and as practical men they must all feel that Shorthorns, at all events, could not be reared and grazed to advantage in every district and county of England. He had been a considerable breeder of cattle of different kinds, and he had always found that the best and cheapest plan was to feed them liberally, to keep them warm and clean during the winter months, and to give them proper shelter during the summer. As regarded inexpensiveness in sheds, an old friend of his recommended sheds that, to use his friend's sporting phraseology, were "got by wood-stack out of clay-pit" (laughter). Perhaps those inexpensive sheds which broke the wind and protected animals from storms were the most useful. He could not help expressing the opinion that the landlords of England could not do greater service to their tenantry, and through them to the country at large, than by keeping good male animals for the use of their tenants. That would conduce very much to the breeding of the best stock, to early maturity, and to the increase of the supply of food of the nation. Notwithstanding what had fallen from Mr. Ramsay, respecting bone-dust, he did not believe it was the best kind of manure for the Eastern County pastures, or that it would lead to such results as that gentleman appeared to anticipate. He (Mr. Hobbs) had sometimes kept Alderney cows; he had one a short time ago which produced 20lbs. 2 oz. of butter in a week. Mr. Wallis had raised a very important question for farmers, in saying that if they followed a six-course system, instead of the four-course, they would be able to rear quite as much stock and produce as much beef. He (Mr. Hobbs) thought that must depend upon peculiarities of district (Hear, hear). What might be beneficial in the midland counties would not be so, as Mr. Hudson would probably tell them, in Norfolk, or as he himself would say, in Essex. In these last-mentioned counties, the four-course system would, he believed, be more profitable. However, the matter was one deserving of grave

consideration. No doubt, in the present day, the rearing, and even the feeding, of stock, would pay better than an expensive mode of cultivation, especially as the price of corn and the seasons were now so very uncertain. Mr. Wallis had rightly called attention to the necessity of a better treatment of animals sent from the continent, from Ireland, and from various breeding districts of the United Kingdom. It was quite considered that animals which were boxed up in vessels, exposed so much to the weather, and treated in such an extraordinary manner both at sea and on railways, must suffer from the effects of disease. The losses to the grazier and the consumer from this neglect must be very great, and he thought some notice should be taken of the matter by the Club, in order that the evil, if not entirely remedied, might at all events be checked. Mr. Wallis made some remarks about over-manning of pastures, and the subsequent mowing of them, and the effect of this in checking their growth. He had heard it stated that some of the finest old grazing pastures in England, including some in the Vale of Aylesbury, were some years ago very much injured by being over-mown. He had always considered that the farmers of England never paid sufficient attention to the varieties of grasses which they cultivated on their pastures. They paid great attention to varieties of root and varieties of wheat, but little attention to the varieties of grasses on their land. It had been said by some of the best authorities on the subject, that a square foot of turf should produce at least 28 varieties of grasses. Many of the best grasses, if sown at certain periods of the year, were thereby checked, and coarser grasses were apt to take their place. (Hear, hear.) He was therefore very much inclined to the opinion that pastures which were adapted for the production of beef should seldom if ever be mown; and that low lands, where coarse grasses fructified the most, should alone be given to the scythe. Before sitting down he wished to remark that having tried several modes of manuring permanent pastures, the conclusion at which he had arrived was this: where a large portion of the land of the farm was arable, and where there was plenty of manure made from roots and straw, commonly called farm-yard manure, there was nothing so good as a small quantity of unfertilized manure spread upon the land, during wet or tempestuous weather in June or July, as soon as possible after the grasses were mown. He himself generally applied about 8 cubic yards per acre. He might add that he had found the bean-straw cut into chaff produce an extraordinary effect when applied as manure, which was accounted for perhaps by the fact that such cuttings contained a great deal of oleaginous matter. Having had experience with regard to some 20 or 30 different manures, he had come to the conclusion that oilcake was the best for improving first-class grazing lands.

Mr. RAMSAY, alluding to the remark of Mr. Hobbs, about the advisableness of landlords keeping male animals for the use of their tenants, observed that Colonel Towneley had gratuitously provided an excellent animal, of the Butterfly breed, expressly for the use of his tenants in the neighbourhood of Newcastle.

Mr. CONGREVE explained that the pastures to which he had alluded were not the convertible, but the old permanent pastures of England.

After some remarks from Mr. NOCKOLDS, which were inaudible to the reporter,

Mr. FRERE (Cambridge) observed that the interest of the question of the improvement of pastures turned, of course, a good deal upon the price of meat, which was well-known to have about doubled in the last fifty or sixty years, an increase which was not due entirely to the increased demands of the population, but partly to the greatly altered circumstances of the corn

growers of England. For a long period the corn growers, looking to a direct profit from their corn, were very well contented if they were enabled to manufacture meat without any considerable loss. Speaking as a farmer of arable land, he must say that that was not at present his own view of the matter; he looked to a direct profit on his stock, and he was not desirous of competing with others at such prices as would not leave him an actual profit on the meat which he made (Hear, hear). There was one part of Mr. Wallis's address to which he listened with extreme interest, namely, that in which he spoke of the disease engendered by the bad treatment of cattle transported to England on board vessels. But he (Mr. Frere) thought they should look in that direction one stage further, and they should extend their view to the English railroad, to the journey which commenced at one railway station and terminated at another. He had himself long abandoned all thought of buying Irish beasts; but he did hope that he was secure against some of the dangers of a railway journey when he purchased stock from a friend living at a distance of fifty or sixty miles, which were driven to the railway by that friend's servant, and received by his own servant the next day. However, in two successive seasons, stock which, to the best of his knowledge and belief, started in the afternoon in a perfectly sound state, when they arrived, having, perhaps, been rather overdriven in the streets of London, were infected with disease. As Mr. Wallis remarked, this question of disease had a direct connection with the price of meat, and it was well worthy of consideration whether some steps should not be taken to ensure that better precautions should be taken against the engendering of disease in railway transit. As regarded pastures, he thought that one great source of injury was, that in purely pastoral districts their growth was stopped early in the Spring, in consequence of there being an inadequate provision of Winter food. He could hardly conceive that there is any district of England where it would not be for the advantage of the pasture land, that there should be a certain portion of arable combined with it, especially with a view to the growth of mangold, so that the stock might be fed on mangold, given with corn and cake in the Spring, and the pastures might not be injured by premature feeding.

The CHAIRMAN, in summing-up the discussion, said he was very glad that they had that evening had such a practical question introduced by so experienced a man. As regarded drainage he had certainly known grass land in his own district to be injured to some extent by that operation, but as a general rule the practical common sense of an experienced man would prevent anything of that kind. He would only add that the omission of any mention of sheep in Mr. Wallis's introduction seemed to be an oversight, inasmuch as mutton was as essential a part of the food of the people as beef.

Mr. OWEN WALLIS then replied. He said Mr. Hudson had made a remark with regard to the better application of the dust taken from the cake, which was no doubt quite correct. His (Mr. Wallis's) sole object in what he had suggested was to prevent waste. Whether it was best to give this portion of the cake to sheep, which Mr. Hudson deprecated, or to beasts in the stall, or to dairy cows, he would not attempt to determine, being quite confident that every farmer would find out for himself what was the best means of disposing of any cake which he bought. Mr. Little spoke of the use of cake for breeding stock. That such an application might be useful both for the beasts and for the land was indisputable, but his (Mr. Wallis's) view had more to do with the feeding of animals for the butcher than with the rearing of

young stock, except so far as they were intended ultimately for the purposes of the grazier. Mr. Little spoke of the necessity of manuring the grasses on poor soils. That that was very much wanted there no one could possibly doubt. The grass lands of England, regarded as a whole, were a disgrace to the country, the attention of farmers having been so much absorbed in their arable lands, that their grass lands had been almost entirely neglected, and, as Mr. Hudson remarked, grievously robbed. Mr. Congreve appeared to him to have entirely misunderstood the purport of his paper when he said that he (Mr. Wallis) would not advise that cake should be given to lean beasts. He (Mr. O. Wallis) alluded in his paper, not to store cattle in the yard, but simply to beasts that were lean, and being grazed with a view to their being fattened on pastures. To begin with lean beasts in the summer would be too expensive, and would not pay; and it was in connection with that point that he recommended the drafting of only the very fresh beasts into those pastures where cake was being used. He had used cake in winter with store beasts to as great an extent perhaps as almost any one—to the extent of 50 or 60 tons a year. As regarded drainage, he did not refer in his paper to the best description of pasture lands, such as those in the neighbourhood of Market Harborough and Aylesbury. He had never advocated attempts to render such lands dry, believing as he did that they would be injurious; but with respect to the great majority of the clay lands, he firmly believed that it was impossible to over-drain them. Mr. Shaw had alluded to tenant-right. That was a very delicate question, but he was sure there are no class of persons in this country who had so great an interest in the subject we are discussing as landlords. It must surely be the interest of landlords to have their pasture lands improved, and there could not be a more effectual mode of securing that object than to make allowances to tenants when they quitted a farm, for the improvements caused by the extensive use of cake and meal for a number of years. Mr. Ramsay seemed to consider that the high price of labour was caused by the high price of meat. He (Mr. Wallis) did not agree with him; on the contrary, he thought the high price of meat was partly caused by the high price of labour. Mr. Bradshaw appeared to be surprised that bones did not produce the same effects in Surrey as in Cheshire. He (Mr. Wallis) attributed that difference to the fact that the lands of Cheshire had been dairied from time immemorial. All the phosphates had been extracted in Cheshire by the dairy process, and hence the application of phosphate of lime told there with remarkable effect; whereas in Surrey no such practice having prevailed, bones were not required to anything like the same extent. Mr. Hobbs had alluded to his (Mr. Wallis's) advocacy of the six-course system. He was quite sure that that system could not be followed in any soil where rye-grass could not be grown with advantage. In the Midland Counties, where rye-grass was very luxurious, more wheat was got on that system than could be obtained in any other. He agreed with Mr. Hobbs, that it was beneficial to apply a portion of farm-yard manure on poor pasture soils, and to apply artificial manures to the arable land. Perhaps there was no better application of manure than that which Mr. Hobbs advocated, namely,

the putting, as soon as the grass had been mown a dressing of about six or eight loads of good farm-yard dung per acre. The effect was marvellous, and nothing could be more effectual than such an application during hot weather. He agreed with Mr. Frere that the infection which arose in the transit of animals by railway was a most serious matter. Infected animals were placed in railway-carriages, and remained there for very many hours; those carriages were perhaps not cleaned, and thus the saliva from the mouths of the infected animals remained on them; and when fresh beasts succeeded them the contagion which resulted became a source of great loss (Hear, hear). Mr. Skelton had remarked upon his (Mr. Wallis's) omission of any mention of sheep feeding on old pastures. Now, the explanation of this was very simple. Sheep feeding was so well understood, that there was, in fact, no difficulty in getting good mutton, whereas there was great difficulty in getting good beef (Hear, hear). Almost any quality of sheep could be obtained at a good market, but an adequate supply of good beef was a rarity, and on that account his remarks were confined to beasts (Hear, hear).

On the motion of Mr. JOHN THOMAS, seconded by Mr. J. WILLIAMS, thanks were voted to Mr. Owen Wallis for his introduction; and on the motion of Mr. HUDSON, seconded by Mr. O. WALLIS, the customary acknowledgment was made to the Chairman.

NEW MEMBERS.

The following gentlemen have been elected Members—

At the March meeting of the Committee:—

R. B. Byas, Neville Park, Tunbridge Wells.
D. Gregg, 28, Cornhill.
R. Emery, Hunston Place, Storrington, Sussex.
H. Raynbird, Basingstoke.
J. M. Wills, Globe Wharf, Rotherhithe.

At the April Meeting:—

T. Bigg, Cronstadt House, Abbey Wood.
A. B. Bloxham, Pinner.
Sir Brook Brydges, Bart., M.P., Goodnestone Park, Wingham.
W. J. Brown, Hazlebury Box, Chippenham.
J. Couston, Champion Hill, Surrey.
F. Froom, 78, Connaught Terrace, Hyde Park.
J. Gee, Welford.
A. Pontey, Plymouth.
W. Spencer, Chalfield, Trowbridge.
R. Thomas, Bletsoe.
T. L. Thurlow, Barnard's Park, Horsham.
R. Upcher, Kirby Cane, Bungay, Norfolk.
W. Vivian, Treeron Villa, Haverstock Hill.

At the May Meeting:—

W. W. Cooper, Burnham, Thetford.
W. J. Crofts, Church Lawford, Rugby.
H. Page, Walmer Court Farm, Deal.

 In accordance with a resolution passed at the May meeting of the Committee, a House Book has been provided, in which Members are requested to enter their names on their arrival at the Club; while a similar notification will be made when they leave town.

SAINFOIN SEED.

An important question as to pure Sainfoin samples was decided in the Common Pleas last week, *Mr. Davy*, a Berkshire farmer, being the plaintiff, and *Mr. Gillett*, a farmer and seedsman in the same county, the defendant. It had been tried in the County Court, but the jurors divided, three to two in favour of the plaintiff; and it was removed accordingly, by *certiorari* to Westminster, where it occupied a great part of Monday and Tuesday, Mr. Justice Keating presiding. The seedsmen-ranks were reinforced, on the defendant's side, from the metropolis; and the verdict turned on the amount of burnett seed among the 5½ qrs. of sainfoin sold by the defendant to Mr. Davy, without a sample or a warranty.

It was allowed by the skilled witnesses on both sides that you would expect to meet with it in every sainfoin sample, but Mr. Davy's per-centage of it, according to the testimony of the witnesses, and Prof. Buckmann especially, who thought it was a crop of burnett, must have been something enormous. The seed was duly drilled in with barley in the February of 1858, and fed with sheep that autumn, mowed in 1859, fed again in 1860, and then ploughed up as being perfectly useless, instead of running out its five or six years; and at the end of that time Mr. Davy applied to the defendant for compensation, and wished for an arbitration by a mutual friend, who certainly fixed the claim for compensation at a most moderate figure. The defendant declined all such overtures, and principally relied on the claim being a stale one, in consequence of the lapse of time, and on the fact that the plaintiff, instead of merely running his lambs over the sainfoin after the barley was cut, had folded sheep on it, who had eaten the very heart out of it, and laid the foundation for lob and other weeds among the plants next spring.

The general mass of his evidence went to show that no sainfoin samples were now free from a very great admixture of burnett, and that no purchaser could expect it. In shape the two seeds are very distinguishable, as the sainfoin is oval and the burnett has four angles; and while the former costs 2½l. a pound, the latter is only 1s. The seedsmen's theories were very various. One had seen more than one part in five burnett; another thought a fourth or a fifth a fair sample, but had never seen less than a fourth, and did not expect, on an average, to get less than a sixth in it; while some said an eighth or a tenth. A great Strand dealer "would not give a fourth burnett if he knew it. I should not have done you justice if I did." In fact, he went so far as to say he would not sell it if it was in that state, but would clean it. Another eminent dealer said that he might send three or four per cent, out in his samples, but certainly not more than five; and has for twenty years past only recommended milled seed—i. e., set loose from the shell. He added, there "has not been much more burnett of late years, but there has been much more noise made about it. If I was asked for pure sainfoin, I would not send it at all; if I was asked for the best, I'd send the best I had." He, however, thus qualified the last sentiment on cross-examination: "I should not do you justice if you paid me the best price, and I sent you one-fourth burnett." The plaintiff, as it happened, had paid the top price, 52s. in 1858, and hence this witness virtually settled the question against those who called him. The jury, after a very short consultation, found for the plaintiff for the £41 6s. 9d. claimed. On the count charging fraud there was a verdict for the defendant, as there was not the smallest ground for attributing to him anything of the kind. The seed was proved to have come to him direct from Mr. Forshaw, a very aged and infirm farmer in the neighbourhood (whose health alone prevented him from travelling up to speak to the fact), and had been passed on at once to the plaintiff.

BATH AND WEST OF ENGLAND SOCIETY.

The monthly meeting of the Council of this Society was held on Saturday, May 4, at Waghorn's Railway Hotel, Taunton, J. W. Buller, Esq., M.P., presided. The following were also present:—Messrs. J. Gray, H. G. Moysey, Jonathan Gray, E. S. Drewe, J. Widdicombe, W. Thompson, J. Daw, C. Gordon, jun., J. P. Pitts, J. Fry, E. Archer, W. E. Gillett, J. W. Walrod, J. D. Hancock, R. Bremridge, R. Dymond, H. C. Andrews, C. Bush, E. U. Vidal, J. H. Cotterell, R. Smith, J. Hussey, J. Lush, H. A. F. Luttrell, and W. Wippell.

WELLS MEETING.—The deputation appointed at the first meeting to visit Wells, and to inspect the site of the proposed exhibition yard, namely, Ash Close, reported favourably, and that city was definitively fixed upon as the place of exhibition in 1862.

FINANCIAL.—Dr. Gillett brought up the quarterly statement of accounts and bills, which were ordered to be paid.

TRURO MEETING.—Dr. Barham presented to the Council a programme, drawn up by the local committee, of the proposed amusements for the exhibition week, consisting of a series of conversaziones, and a visit to the mining district by an excursion train, which was approved of by the Council. The Director reported that the entries of stock, in the various classes, were very good, and the number of competitors more numerous than on any former occasion. The sum of £500 was voted for the current expenses of the Truro exhibition.

NEW MEMBERS.—The following gentlemen were elected:—Mr. John Sobey, Liskeard; Mr. Robert Nichols, Lostwithiel; Mr. Peter Davis, Probus; Mr. Toome, Warminster; Mr. R. T. Pender, Falmouth; Messrs. Hosking and Son, Hayle; Mr. Joseph Gundry (a governor), Hyde, Dorset; Mr. William Frith, Wells; Mr. John Palmer, Holyway, Launceston; Mr. Jones, Ringwood.

REMARKS ON STABLES.—Plenty of breathing room is of the first consequence, whether we are providing entertainment for man or beast. All cannot afford to lodge their horses so well as others, or even to give themselves as much breathing space as science and common sense say is desirable; but many, even in stables where cost has not been considered, restrict their horses most unwisely, simply for want of thought and knowledge. It is well known, as pointed out by Mr. Miles, that a horse, whose stable is well lighted, drained, and ventilated, and in which he has room to move, will do considerably more work, and require less corn, than the same horse would do, if kept tied up in a badly-contrived stable, although his allowance of corn may be greatly increased. The vitiated atmosphere he is doomed to live in, the want of pure air to breathe, and the absence of the cheerful influence of light, combine to make him dull, listless, and dispirited; and no amount of corn can counterbalance their depressing effects. In forming the boxes, it must be remembered that while the horse should have a quiet corner to feed in, he likes to see his neighbour. A ramp in the partition, falling away from the rack, filled up with ½-inch round iron bars, placed one inch apart, admits of these conditions. Bell traps in many situations are invaluable, but in a stable they are out of place. They form evaporating pans, filled with liquid refuse, to afford a constant supply of noxious gases. The flooring of stables is a matter of very considerable consequence. Nothing can be worse than the pebble pitching which is often used. It is inconvenient for the horse to stand or lie upon: soon falls into pits; enables the earth to absorb any amount of moisture, and frequently retains it in puddles to evaporate and poison the air. Good clinkers set herring-bone fashion, on a bed of concrete, form the best stable floor that has ever been suggested. Where the expense of clinkers is an objection to their use, hard and unabsorbent common bricks placed on edge in a herring-bone pattern (which improves the foothold) may be substituted. Iron for mangers Mr. Miles thinks a cold and uncomfortable material for a horse to feed out of, particularly in winter, when its surface is wetted with the condensed breath of the horse.—Builder.

THE ROT IN SHEEP.

DISCUSSION AT TAVISTOCK.

Mr. Reuben Thomas, farrier, of St. Austell, and Mr. Alfred F. Bickford, veterinary surgeon, of Totnes, recently met, as we intimated some time since they would, in the Tavistock Guildhall for the purpose of discussing this important subject. It being the fair day a very large number of farmers and others immediately interested in the question were in attendance.

Mr. WEEKES, having been voted to the chair, proceeded at once to call upon

Mr. THOMAS, who, on rising, said he looked upon the science of agriculture as the most important of any science, for the rich and poor, old and young, had to live by it. The rot in sheep was one of the greatest calamities that agriculturists had to contend against. The rot disease and the fluke disease were two separate diseases, although several theorists classed them together, and this, he believed, was one of the reasons why they had been unable to discover a remedy. The theory of the present day was supported by doctors, professors, men of learning, and had been confirmed by public opinion. Now, he would tell them that doctors disagreed, and that public opinion could not be depended upon. Doctors had disagreed for more than 300 years; one said one thing was the cause, while the other contended that it was the effect. They all agreed upon the anatomy or the structure of the sheep, how the vessels acted; but upon this identical disease they differed. To show that public opinion was at variance, he said that Dr. Harvey, about two hundred years ago, differed about the left ventricle of the heart, and the consequence was, that he was censured by other doctors and by physicians. But every veterinary surgeon and every farmer believed that Dr. Harvey was right. A few years ago they believed they were going to be ruined by the introduction of Sir Robert Peel's cattle tariff, and later still they entertained the same opinion with respect to his measure for the Corn Law Repeal; but their fears were unfounded, such a result had not come to pass. Now the question came, what were they to do? His answer was, Search for the truth into the laws of nature; every farmer should be a naturalist, and should bring his son to be one too. He denied that to be a naturalist a man must be an Atheist, and said he should give them evidences of it. He had to stand up by the side of a scientific man, and he only came there to give them evidence of what he had seen and what he knew himself from his own experience, and with that he was ready to meet the whole world. They must not look to him for any set speech: it was not a question of education, but of identity. The first thing he had to do before he introduced his subject, was to tell the meeting how the present discussion was got up. Mr. Bickford's letters had appeared in the papers, in which he contended that the rot disease was one complaint whilst he (Mr. Thomas) in letters he had written, contended it was two. He would ask them not to be moved by any opinions they might hear expressed, but to reason, calculate, and appeal to their own judgment. The speaker then referred to the notice of Mr. Bickford's lecture which appeared in the *West Briton*, and which he believed to be as good as Professor Simonds's upon the same subject. In that lecture Mr. Bickford stated 1st, that in the earliest stages of rot

the symptoms are exceedingly obscure. 2nd, We know that in the early stages of rot sheep improve in condition. 3rd, That flukes beget eggs, and these afterwards are found floating in the bile, and are discharged with the dung of rotten sheep. 4th, That the eggs beget animalcules, and they transform themselves several times between the eggs and the flukes; and that these eggs maintain their vitality for a length of time incredible; and that sheep get these flukes by eating the animalcules. 5th, That the flukes are the cause of the rot in the liver. He (Mr. Thomas) did not believe these eggs would maintain their vitality; for they must have a very small coat, and it would be impossible for them to stand the heat of the sun, and still maintain vitality. The next point for him to argue was, that flukes were not the cause of rot; and in doing so, he would show them that sheep died from rot, and not from flukes. He contended that the cause of rot was from sheep lying too long in low, damp lands. They all knew that if there was one elevated piece of ground, the sheep would climb up and get close to it, like a lot of limpets to a rock. The diseased sheep would appear to get fat: they would appear a little plumper, but all they could get out of them was water, and not fat. As regarded practical experience, he held a good position; and he would tell them honestly and candidly that seven diseases out of ten arose from ignorance and neglect in management. So soon as the farmer began to study the constitution of sheep, and the nature of the soil they were placed on, he would find out a remedy to prevent these diseases. He contended, first of all, that sheep took cold. That interrupted digestion, and fermentation took place. Inflammation set in upon that; and the liver being the nearest neighbour to the stomach, inflammation seized that almost directly. Then the blood-vessels stopped flowing, which brought on gangrene; and then followed the rot, or putrefaction. If such were the case, would any man of common sense tell him that sheep was improving? Would any schoolboy eight years old tell him so? It was ridiculous in the extreme. Mr. Bickford told them that rot, in its first stages, could be prevented; but such a theory was contrary to their experience. This disease—the rot—was never known on dry land, except in particular sheep that might be penned down, or from other causes. It all originated, as he had before stated, from low, damp lands. He had made every inquiry, and he had found that flukes were not the cause of rot. This brought him to the fluke question. Now they must know the origin of everything they took in hand. They might divide the world into three kingdoms—the animal, vegetable, and mineral kingdoms. In all these three, everything acted upon laws. They should not have anything to do with the mineral kingdom in their debate, but only with the animal and vegetable. What was the cause of flukes? That belonged to the animal kingdom. Many farmers thought that sheep eat certain vegetables, which got down into the stomach and formed little animals. That was not so. All animalcules were caused by eggs or spawn, and these flukes must necessarily be caused by one or the other; but it was impossible for him to say which. The sheep got these into their livers, and when they were there in any large quantity they destroyed the glands of the liver, and the sheep got

into a state of great debility, their eyes became very weak and watery, and why? because the flukes destroyed the vitality of the liver. The sheep went away and died just like those that died from starvation. Some thought, and Professor Spooner did, that sheep got these flukes by drinking animalcules in the water. Now, all the animalcules he had seen in water, were of a fish kind. The earth kind had all been of the animal kind. Now, then, take the fluke; that, if it was fish taken out of the water, would not live, and if exposed to air it would not live there. That was strange, for it was neither fish nor animal, but something between, but still of the animal kind. The great question was, what caused flukes? if they could tell they would be able to prevent the consequences. The first thing he would introduce was a vegetable, which grew in July, bearing several flowers. They all appeared to be something alike, being very adhesive. Flies alighted on them, and if sheep eat those flowers at that particular time they were sure to have flukes in them by Christmas. Professor Simonds, in his lecture, had made no discovery beyond what was made 300 years ago, and Mr. Bickford had thrown out nothing as a preventive, and they had now to think how these vegetables should be spawned or should have eggs upon them. There was no proof to show that it was fly that alighted on these plants, but still it was highly probable that it was. Let them look at the history of the fly. Every house cook could tell them that if a fly blew upon her meat she would have worms in it, and not only so, but this insect destroyed living animals. It blew its eggs in the wool, and if not destroyed they would eat the sheep. Farmers knew that their bullocks ran away by the wasp, as they called it, but what was it? why the fly blew its eggs upon it. This he regarded as strong relative evidence in his favour. The gad fly stung the horse and deposited its eggs in its hair, and the horse took off the eggs, carried it down into its stomach, and brought it off in the shape of worms. Mr. Thomas then referred to Mr. Bickford's argument with respect to keeping those eggs, and said that it was one that every schoolboy would laugh at. Another thing, flukes were found in unweaned lambs. They would be very small, and, perhaps, there would be five, six, seven, or eight. Now, that was very remarkable, but still he was able to prove it. After explaining the circulation of the blood and chyle, he said that no evidence had been given to show that flukes came from animals; it was all a matter of opinion; and, in conclusion, he advised them to remember what a certain Grecian writer said, "You must not believe any doctrine because you see it written, nor because you hear it from tradition, nor because the philosopher believes it, nor because a certain doctor asserts it; but you must search for the truth and know it yourself, and then you may venture to believe it."

MR. BICKFORD: As far as I am personally concerned in this discussion, I have not the slightest desire to make use of a single expression that may be deemed personally offensive to the lecturer. At the same time, I feel that my view and his on this important disease are so diametrically opposite, that I shall not be able to avoid the occasional use of somewhat strong language, in order that I may express my disapproval of some of his statements, and at the same time convey to you my reason for so doing. The lecturer has so often alluded to his love of truth, that really I have almost been led to infer that he imagines himself to be in the possession of a monopoly of that virtue. I have not come here this afternoon to offer a factious opposition; but as I have given the disease a great deal of attention, I have come to the conclusion that a rational system of treatment cannot be adopted without the aid of scientific principles, or without an acquaintance with the structure and function of the liver, which organ is the seat of disease under discussion. Although such is the case, in my opinion there are certain prominent points, landmarks as it were, that can be readily understood when pointed out. I will not endeavour to mystify you by using scientific terms or technical expressions, but I will endeavour to employ commonplace language to illustrate well-established facts. Most of you have had the opportunity of reading the able, scientific, and exhaustive lecture on the "Rot in Sheep," recently delivered by Professor Simonds, before the members of the Royal Agricultural Society. As such is the case, it would be both tedious and unnecessary for me to go much into detail. But as there are many statements of the lecturer, and several other points that I disapprove of, I think some harm would be done if they remained uncontradicted. The lecturer has repudiated

the fluke theory, recently advanced by myself, as absurd. It matters but little to me, comparatively speaking, whether you agree with him or not; but I do hope that you will not sanction such objections, as they are entirely opposed to all modern research; for of this I feel assured, that if the disease continues to prevail, fresh investigations will be called for; and I have not the least doubt but that similar opinions, though they certainly admit of further development, will be advanced and put forward by future investigators. The lecturer has made a most unfortunate mistake in denying that fluke eggs pass off with the dung. It may or may not be true that the product of these eggs pass through the successive changes that have been described by those who have spent much time and who have employed great ingenuity in the process. It is not enough for the lecturer to reject the experiments of others, without his own tend to contradict them. In one of his letters he has expressed his high admiration of the inductive system of philosophy. Has he this afternoon given us even a rough outline of a single experiment that he has performed with that object? The boldness of a man who rejects the experience of every investigator when it is contrary to his own may be admired. I do not despise originality of thought; on the contrary, I feel admiration for an original thinker; but, really, when I find that his explanations of disease are contrary to every approved principle of practice, I think they ought to be condemned, and in as strong language as possible. The lecturer has spoken of the advantage of relying upon his own independent judgment. Surely if we depend upon our own unassisted observation for a knowledge of disease, the science of medicine must stand still or cease to be. "If no use (says Dr. Samuel Johnson) be made of the labours of past ages, the world must for ever remain in the infancy of knowledge." So long as lectures are given which are but epitomes of the opinions of old authors, so long as we continue to go on the old and beaten track, nothing new will be discovered; we may expend much labour, but no real progress will be made. All who have recently studied this disease, who have had the advantage of a scientific education, have sought to clear up the mystery by studying the natural history of the liver fluke, perhaps the only point connected with the disease that is obscure. The changes that it successively passes through, from the egg to the perfect fluke, may or may not be traced with perfect satisfaction; but I think no reflection on that account ought to be cast upon the members of the veterinary profession, when we know that such men as Owen, Ehrenburg, Steenstrup, and many other names almost equally illustrious in the annals of entozoological literature, have after much laborious research failed to make the discovery. I, for my part, cannot help thinking that their opinions on such a subject are immeasurably superior to the empirical and unscientific researches advanced by old authors, even although they may enjoy the advantage of being sanctioned by immemorial antiquity. If you examine the writings of all who have written on the "rot," from a period the most remote down to the present day, you will find a surprising agreement in all the main points; they differ only as to the specific cause. I think it is a matter for congratulation that so much unanimity of opinion does exist. Whether you attribute the cause of rot to sheep eating the coathe plant—to the decomposition of grasses, aided by warmth and moisture—to the taking-in the germs of the flukes, which become perfectly developed either in the stomachs or livers of sheep—I say does not the scientific teacher and the simple agricultural labourer, who has nothing but common sense for his guidance and Nature for his instructor, equally agree that wet, boggy, and lands that have been flooded, are especially, nay, exclusively, dangerous to sheep? Perhaps the most general idea that is entertained is, that the disease is caused by the sheep eating the coathe plant. Where is the origin of this idea? If we search for this plant, where are we most likely to find it? Why in those parts of the field that are the wettest. Cannot almost every agriculturist who has suffered a loss from this disease readily point out the particular field or fields, ay, possibly even the particular spot, where, in his opinion, his sheep contracted the rot? The general idea is, that if sheep eat these plants, which are acrid, that they drink the stagnant water which collects in pools around or near them. But then we know that the disease is only contracted during the summer and autumn months. If we taste these plants at any period of the year, are they not especially hot to the palate. If sheep eat them in the winter months, are they not equally likely to

drink; but do they then acquire the rot? This seems to me a conclusive proof that these plants are not the cause of rot. Although such is the case, we have this practical fact for our guidance, that where these plants abound such pasturage is very unsafe, and that under an improved system of drainage these plants cease to grow, and that a much better herbage springs up. I will suppose that I am called to see a flock of sheep which betray unmistakable symptoms of the rot. I inquire on what land these sheep have been deposited; I examine it, and ten chances to one but that the owner will himself point out the coathe plant; and yet believing that this plant is the cause of the disease, he will persist with blind infatuation in putting his sheep where they can eat this plant and drink this stagnant water. To me that seems very wrong practice, in fact, very much like running to destruction with his eyes open. Is the disease confined to low and damp situations? No! Bakewell, and a host of other authorities almost equally high, have demonstrated that the disease can be unerringly produced. Bakewell, as you know, was the founder of the celebrated breed of Leicester sheep.—“When particular parcels of his best-bred sheep were past service he fatted them for the butcher; and to be sure that they should be killed and not go into other hands, he rotted them before he sold them, which, from long experience, he could do at pleasure. *He had only to flood a pasture or meadow in summer, and it invariably rotted all the sheep that fed on it the following autumn.* After the middle of May, water flowing over land is certain to cause rot, *whatever be the soil.* He acted thus with several of his fields, which without that management would never have affected a sheep in the least. The water may flow with impunity all winter, even to the end of April; but after that the above effect was sure to take place,” &c., &c. There are certain pastures on which it is dangerous to put sheep at all during the summer months, no odds whether the season be wet or dry. On such lands are to be found these coathe plants, which are only to be found in boggy, ill-drained land. But when the rot is generally prevalent, when it rages as a pestilence as it were, we have had a very wet season, such as the past. And then the rot is sometimes confined to pastures in which not a single variety of these so-called coathe plants can be found. If land that has been sound for many years can be converted into rotting land, by merely flooding it for a week or so in the month of May, and then turning on sheep after the water has subsided, surely no one can doubt but that the disease is entirely independent of these plants. The lecturer cannot lay much claim to originality of thought, even when he asserts that sheep became rotten by grazing on damp pastures. If lying on damp pastures had much to do with the disease, how does the lecturer account for the numerous instances of sheep contracting the rot by grazing on a common or a pasture for the space only of an hour, and during the whole of that time not a single sheep had lain down. These cases are well authenticated. Again, if lying on damp pastures had much to do with the disease in the way the lecturer supposes, don't you think, Sir, that a great deal more damage would be done to a flock of sheep by keeping them on land partially covered with water during the cold winter and spring months? Indeed, it is generally considered that there is no danger as long as the land is covered, even though sheep may have to wade for their food; it is after the water has subsided that the danger commences. This fact has, in my opinion, led to the idea that miasm or noxious vapour was the cause of the disease. Many have thought that the noxious vapour or miasm that arises from the decomposing grasses, when the air is warm, is specially injurious. If cold, or chill, or inflammation had anything to do with the origin of the disease, why surely hundreds of sheep would be more likely to contract the rot during the cold winter months than during the mild genial weather of summer. I agree with the lecturer that it is bad practice to keep sheep penned upon cold, wet clay land; although I differ with him as to its *modus operandi*. If a sheep's liver is stuffed with these flukes, he requires all the stimulating food that can be given him, and all the protection from cold that can be afforded. In such a severe case as this, do what you will, I believe you will scarcely be able to make him accumulate flesh or fat, or even make him hold his own. But suppose a sheep to have a good many flukes in his liver, enough to interfere materially with health, but not enough to spoil the organ—particularly if at a time when these flukes, though numerous, have not materially altered the structure of the liver—don't you think that if a

sheep is in this condition he is very likely to be made to accumulate both flesh and fat, if liberally fed and protected from the cold? Many sheep that die would live, if so treated, simply because they have not the vital energy to resist those depressing causes that they could readily withstand if their livers were not at all diseased. These sheep are starved down; consequently when they are treated with warm tonics, such as sulphate of iron, gentian, and ginger, aided by warmth and nitrogenized food, such as oilcake, their livers not being greatly diseased, they recover. But any man who promises to invariably cure rotten sheep, is, I have no hesitation in saying, either a fool or an impostor. The lecturer may possibly have noticed the stomach of a single sheep, or even of a flock of 100, to be distended with gas; I agree that foul pasture is very likely to produce this distension, and that Epsom salts and ginger is a proper remedy. But does he mean to assert that it is the prominent symptom of the early stage of rot? Does he mean to imply that this distension of the stomach or hoove is the forerunner of these flukes in the liver? I know that the lecturer confessedly likes to trace an effect to its cause. But is this the result of his investigations? The rot is only contracted during the summer and autumn. Every one who has written upon “rot,” whether ancient or modern, is pretty well agreed upon this point. How can the disease be thus engendered? Why surely it is as plain as the sun at noon-day that these flukes were in the liver previous to the stomach becoming distended. The beautiful and modern theory of the alternation of generations of these flukes is ridiculed, and opinions utterly opposed to the teachings of modern science are advanced with unblushing confidence. The lecturer should recollect that there is no feeling to be more despised than that of a contempt for everything that we can't comprehend. I will not exhaust your patience by entering into a detailed history of the liver fluke. I will merely observe, on that point, that the researches of modern investigators have, in my opinion, conclusively established the fact of the products of these eggs (in which stage of their several transformations I cannot with accuracy determine) being received into the organisms of sheep. These conclusions are based on that which is capable of inquiry and proof. For all practical purposes it is a matter of comparative unimportance whether these germs pass into the organisms of sheep in the shape of cercariæ, in any other form, or even in the form of an elephant for the matter of that. We have this practical fact for our guidance, that in ordinary years the disease is confined to those pastures that have ill-drained marshy spots; and we have abundance of evidence to prove that after this land has been thoroughly drained, it then becomes perfectly sound. I do not wish to be impractical. I think there is not a single agriculturist in this room, who has a few acres of such land, but would gladly prefer, independently of its tendency to rot his sheep, to have such land thoroughly drained, as he would know that its fertility would be much improved. Suppose a man takes a farm which contains a few acres of such land. He knows from tradition that many sheep have been coathed there. Don't you think, Sir, that he either ought to apply the remedy, or else he ought to keep his sheep elsewhere during the summer and autumn? Your unacquaintance with the structure of the liver will prevent my entering into a lengthy explanation of the reasons why a sheep in the early stage of the rot should rapidly improve in condition. But really the fact that they do improve in condition is so well known, that men with the commonest understandings have availed themselves of that knowledge, for the purpose of furthering their interests; and I have therefore no inclination to discuss the point. The rather pompous assertion of the lecturer that the idea of sheep thus rapidly improving is contrary to nature doesn't affect me in the least. When the lecturer has lived a little longer, and has paid more minute attention to the early stage of rot, he will have ocular demonstration of the fact. The liver of a sheep is not altered in structure at the outset; its functional activity is, on the other hand, increased; a much larger proportion of the food that is digested is converted into blood, and a more rapid accumulation of flesh and fat takes place as a consequence. During such very wet seasons as the past the disease is very general. Many of you can cite cases in which sheep have become rotten on land that contains no marshy spots. Well, what is the common-sense deduction? Why, seeing that the disease is not to be cured, that every precaution ought to be taken to prevent it. If I were to recommend you to put your sheep upon dry pasture, I

should recommend you to do that which is impracticable. Such could not be done by those who farm the level land of certain districts. Traditional experience teaches us, that if sheep are provided with a portion of dry food, such as hay, oilcake, salt, &c., they are less susceptible. And experience, not yet a year old, has taught us that sheep on one farm were kept perfectly sound by supplying them with such food; while those on neighbouring farms, placed precisely under the same circumstances, with the exception of having no food of this kind, were affected. Every precaution must be taken to prevent the disease; and as it is only contracted from May down to about September perhaps, that is the time for you to exercise your vigilance. If you then neglect to do so, you realize the truth of Lord Bacon's apophthegm, that "occasion presents a bald pate"—after presenting her front locks no hold is taken." These are the simple measures for you to adopt; they will repay you far better than a fruitless search after specifics that are only recommended by those who wish to fatten upon your credulity. Whoever has made an examination of the liver of a sheep that has died in the advanced stage of rot—whenever is acquainted with its structure and function in a state of health, must know that it cannot be restored to its pristine condition, or that anything more can be done than prolong a miserable existence. The lecturer may tell you that he can prevent the rot; but when he tells you that he can stay the ravages of flukes, I can only give it as my decided opinion that no satisfactory progress will be made, that no satisfactory solution of the mystery will be arrived at, so long as investigators are influenced by such absurd, inconsistent, and empirical fables.

Mr. THOMAS reiterated his former opinions. Mr. Bickford, he said, had insinuated that he (Mr. T.) was against those men who used medicine, but he was not opposed to it for certain purposes, as for instance when given to horses or bullocks; but he would ask the farmer what he got by paying for medicine to prevent the rot or flukes? Mr. Bickford had his eye to medicine, but he looked at the community.

A Voice: Let's hear the cure you suggest. (Confusion, and cries of "Chair.")

Mr. THOMAS said, the course to be observed would be not to allow their sheep to go into those low lands at a certain season when the flies he referred to laid their eggs or spawn over the vegetable he named. The next thing to be observed was not to allow their sheep about October and November to lie by night on low damp lands, and they would not then get the flukes nor be rotted.

Mr. JOHN BICKFORD, veterinary surgeon, of Kingsbridge, here rose for the purpose, as he said, of discussing this question with the great man from the west (laughter and confusion)—but he was called to order.

Mr. A. F. BICKFORD, in reply, stated that Mr. Thomas had asserted that these eggs did not pass off in the dung of the sheep. It was a matter of fact that if they took a little of the chyle, and looked through a microscope, they could see those eggs in countless thousands; and if they examined the dung of rotten sheep they would have ocular demonstration. If he asserted a fact that had been confirmed by hundreds of investigators, and Mr. Thomas denied it, he would ask whether it was in his power to do more than simply state the fact which had been so confirmed. He knew that the sympathies of the majority of those present were with the lecturer (cries of "No").

A gentleman here rose to order, telling Mr. Bickford he had no right to jump at such a conclusion (confusion).

Mr. THOMAS said Mr. Bickford must show him that animalcules were to be found in the liver of the sheep: if he did rot, he must give up his point.

It being now six o'clock, and as most of the farmers were desirous of going by the 6.5 train, Mr. Bickford was unable to speak again, and Mr. Thomas then expressed his willingness to meet him again in six weeks' time.

Mr. G. PARSON, in proposing a vote of thanks to both the speakers, said he believed that if they had both met together and quietly talked the matter over, they would have arrived at one and the same opinion.

Mr. SLEEP thanked the lecturer for his attendance, but he could not help saying that his physiology was bad; and if he would read something more about the nature of the disease he would be able better to come forward and discuss with such a scientific man as Mr. Bickford.

The resolution was then adopted.

Mr. THOMAS asked what books he should read; but

Mr. SLEEP told him he did not want to enter into any controversy with him about the matter.

A vote of thanks to the Chairman brought the proceedings to a close.

A portion of the above is taken from the *Western Morning News*, but Mr. Bickford has supplied us with a corrected report of what he said; and Mr. Thomas has since addressed to us the following letter:—

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—I have seen the theory of sheep rot on your paper, from Professor Simonds, and, as your news is circulated all over England for the improvement of agriculture, &c., I think that any reader is justly entitled to the right of inquiry into the meaning of what he sees published. I have read this "Lecture" with the strictest attention, and read it several times over. I have compared it with my own experience, as to this disease rot. I have been acquainted with it for twenty-six years, and I have taken the greatest of pains and fatigue to get at the true nature of this disease. I now can most clearly see how this disease is brought on, and how it may be prevented. It is prevented by me, and by many others as well. If Professor Simonds offers his theory to the world, I think that there can be no reason shown why he can reasonably object to have his "Lecture" investigated. I have already done so. I most sincerely beg, through your journal, to lay my views before the agriculturists of this country in reference to this lecture.

1st. ROT IN THE SHEEP'S LIVER.—I contend that "rot" in English language to be putrid decay, and when once established in the sheep's liver it is out of reach of any Professor to remedy. Sheep may and do have flukes in their livers, and not doing any injury to the liver; but, by lying on damp and clay soils in the months of October and November, take cold in the stomach, get inflammation in the liver, and run up its course to rot, without the slightest injury from flukes, and in this very case the Professor has made a serious mistake. The greater part of the sheep that have died this season have died from rot, and not from any injury from flukes. As for the learned Professor to offer his medicine to farmers for sheep that have rot in their livers! What can he think of himself? Does he think that farmers are stupid, like their oxen? Does he know that his advice is beyond everything the most injurious to the agriculturist? Does he really mean what he says, to put the industrious farmer to useless expense, when he very well knows "that every sheep that is seized with rot in its liver must eventually die?" Why does he not speak honestly and plainly, and tell the agriculturist that he might just as well try to put new livers as to attempt to cure rotten ones? Tell the farmers that their only safety is prevention: not offer them medicine, which will most eventually deceive them and ruin them. Does he know that farmers have heavy rates and taxes to pay, and that they cannot afford to lose their sheep and pay for medicine too?

2ndly, THE FLUKE QUESTION.—The Professor says a sheep that has flukes in the liver, that this constitutes rot, and on the first stages sheep most rapidly improve in condition. If this be the case, the flukes cannot be injurious at the time. If so, how on earth can the Professor call it a disease, and name it "rot"? Why, to be sure, he should name it "fat," instead of rot; if sheep so "rapidly improve in condition." Again, for the fluke. When flukes destroy the cells of the liver, the sheep sinks away in debility and in dropsy instead of rot. There is as much difference in symptoms of rot and the effects of flukes as there is between the fluke itself and the sheep's liver. It most clearly appears that the Professor is altogether ignorant of what he lectures about. Will he offer his tonics in the case of dropsy from flukes in the liver after the cells of the liver are eaten by flukes? No farmer need lose one single sheep with flukes. They can prevent the damage from flukes in sheep by keeping them off from where the sheep get them, or feed them in time, before the flukes hurt them. Very little instruction would so get any farmer up to this mark of calculation. It is vegetable that sheep eat with flies' eggs of spawn on it that

gives the sheep flukes, and only at a certain season of the year; and it only grows in certain moist places. But the Professor laughs at this most important truth. He may. But I will engage to take a number of sheep from a healthy soil where flukes have never been known to exist from any date on the farm. I will only see them eat once each a few mouths' full of a certain vegetable at a certain season of the summer, and seven out of ten shall be fluked by Christmas, if not all of them. I will myself offer to meet the Professor, and try experiments with him. First, I will put a number of sheep before him which I will take from two different farms. From one farm flukes never exist. The other farm sheep are never without them. I will colour their wool, so that he shall not be able to see the marks of soil on their wool. I will defy the Professor to tell any one with certainty the sheep by any symptoms that has flukes from the sheep that has none. They shall be all killed, one by one, opened, and examined, and they shall be all healthy. I am ready at any time. Farmers are anxious for me to meet the celebrated Professor, and fairly test his most "wonderful skill." Or, if he prefers it, I will take an hundred sheep, and rot the whole of them within a few days before his eyes. I will not give them any drug: he may go with me every day and see them if he chooses; and thus I will convince the Professor of what he calls one disease to be two separate diseases. I will show him how to prevent both diseases; and I have been able to do so for some years; and I do prevent these diseases, and so do many others now; and every farmer may prevent if he only knew how. The Professor says in his lecture "that he has discovered the animalcule escaping from the fluke's egg, and it lives in water and afterwards. The sheep drink the water, and get flukes." I will try an experiment with on the "great and grand discovery." He shall take as much eggs of flukes as he likes, and hatch them, turn them in the water. I will get a score of sheep from the soil where flukes do not exist, and the Professor shall drench them with this identical water. I will see it done: I will take the sheep back to the same farm again: I'll chance them getting fluked. I beg to inform the Professor that it's more likely that flukes' eggs produce worms that go into the earth a few days, and then turn to flies at a certain season of the summer. I also beg to inform the Professor that his lecture will not bear the scrutiny of an ordinary self-educated naturalist. In fact, his theory would get crumbled all up. I beg to inform the Professor that his lecture is a metaphysical one, and of no use to the agriculturist. It's very far from a philosophical lecture: it has no foundation whatever on facts.

Your most humble servant,

REUBEN THOMAS,

Practical Farrier and Farmer.

St. Austell, Cornwall, May 11th, 1861.

The new number of the *Bath and West of England Journal*, now just out, contains a most able and elaborate essay on the subject of Sheep Rot, by Professor Brown, the Veterinary Surgeon of the Society, as well as of the Cirencester College. There is a deal of new matter and decisive deduction in this paper, from which we take the more practical points, leaving the Professor's treatment of the fluke theory to the especial consideration of his brother veterinarians.

The article opens with an acknowledgment to the following gentlemen for their courtesy in supplying information having reference to their own or neighbouring localities:—Mr. G. S. Poole, of Bridgwater; Mr. R. Smith, of Emmett's Grange, Exmoor; Mr. Widdicombe, of Torrhill, South Devon; Mr. Darby, of Lytchett, Dorset; Mr. Squarey, of Salisbury; and Mr. Selley, of Witheridge, North Devon, to whom we are indebted for a supply of subjects.

The paper then proceeds with an array of facts and opinions:—

Most fatal Years.—In 1809, 1824, and 1830, as we are informed, the annual estimate of one million fatal cases of sheep-rot was more than doubled. In the year 1833 the supplies of sheep fell off to so great an extent that at Smithfield market they averaged about 5,000 head less than usual

each market-day, and the same falling off was observed in all the country fairs and markets. The statement in *Stow's Chronicle* that "rot" was introduced into Northumberland in 1275 by an imported Spanish ewe, cannot be received as a fact; or, to speak more correctly, the term, as used by him, probably referred in the case cited to *variola* (sheep-pox), or some malignant and contagious disease. As far back as we can trace, the affection has been destructive to sheep; but it has not been confined to that animal, as hares, rabbits, deer, horses, and cows, are said to be liable to it. The extraordinary prevalence of the malady during the past autumn awakens us to the fact that our fancied improvements in breeding, feeding, and tillage do not afford any immunity from such affections; on the contrary, it scarcely permits us to compare our present system with that of years past with any satisfaction to ourselves.

Rot, according to the majority of writers and speakers, is an affection of the liver. Youatt considers it to be an inflammation of the gland; and whilst most authorities deem "flukes" to be the principal cause of the disturbance, and aim at their destruction with the idea of thereby curing the patient, Youatt looks upon them as both cause and effect—an effect of the diseased condition of the fluids, and a cause of its continuance. Some writers refer to the lungs as the primary seat of the disease, considering the affection to be allied to consumption. According to these authorities, the deranged liver, flukes, wasting, and death are all consequences of disease of the respiratory system.

The testimony of practical men is decisive that autumn is the time when the disease is most prevalent; but the evidence as to the state of the land on which rot occurs, as well upon many other points, is contradictory. A reference to my notes gives me the following as the conclusions of different observers:—Moist warm weather in autumn; prevalence of white misty rain; and rain falling at a high temperature, causing a rapid and luxuriant growth of herbage, are universally ranked first among the causes of the disease. Marshy situations; clay-lands; low-lands receiving the waste and drainage from higher situations; and lands that have been flooded, the water having subsided and left only the roots of the herbage moist, are the localities most fruitful in cases of rot, according to a host of authorities. In one case, a field in preparation for wheat, under a dressing with lime, hedge-row and other mould, "the grass grew luxuriantly after this dressing, and 110 ewes placed upon it all died from rot." In the Derbyshire report to the Board of Agriculture it is stated that on a hill of limestone shale, where the pasture was dry and good, and a great deal of rain fell at weaning-time, "causing the grass to grow luxuriantly like a salad," rot was produced. On Lockerly Common, Hants, sheep not bred there took the rot. On Broughton Marsh, Hants, before its inclosure, sheep rotted in summer.

Many cases are recorded of the production of rot in a very short space of time. Thus it is stated that twenty sheep were taken to a fair and six left behind: the twenty died, having, it is presumed, contracted the disease on the road, whilst those left behind were not affected. In another instance some sheep were allowed to roam on a common: one of the number, removed for a short time to have a broken leg dressed, escaped the rot; but the others all died from it. So, again, a Dorset breeder is said to have allowed his sheep to drink from a pond by the way, and 200 of the number died from the disease. A single night's frost was formerly said to arrest the progress of the affection; but the popular opinion is now somewhat changed. Among sheep bred and fed on wolds and downs rot is unknown; but if removed to low grounds that have been inundated by winter rains they have been known to rot in one night. Grazing on certain plants is said to produce rot; for example, *pinguicula vulgaris* (butter-wort), *hydrocotyle vulgaris* (white-rot), *drosera longifolia* (long-leaved sundew). The hay of moist land is a presumed cause of rot. Sheep, after losing their fleeces, are considered most liable to be affected. In the flat water-meadows of Melbourne, Derbyshire, the rot was formerly very rife. Poor sheep, fed on luxuriant grass, are likely to suffer. A curious circumstance is mentioned in connection with some land at Welbeck, belonging to the Duke of Portland.* It seems that, in 1806, there were twenty-five acres

* *Journal of Royal Agricultural Society*, vol. i., p. 368.

below a lake-head. Of this land the greater part was a morass, and had further been robbed of its soil to form the head. Much of it was bog-land, some of it tenacious gravel, and very little was kind sand. There was not sufficient fall to the river to dry the lower part of the meadow, which was consequently very wet, and produced rushes and flags; yet notwithstanding all this it was a very good meadow, particularly for spring-feeding, and ewes and lambs were fed on it for twenty years without the occurrence of rot. In dry summers it produced tolerable crops of hay, without ever being manured. In consequence, however, of some alterations, the land was drained, subsequently to which it gave one good crop; but grass never again grew well, and the ewes and lambs afterwards fed upon this land invariably took the rot, equally on the highest and lowest parts of the meadow. Clayey gravels and red marls, when rain happens after dry weather, have a luxuriant herbage and occasional rot. Poor clayey and loamy soils, where the water stagnates from the compact nature of the ground, are dangerous. Grounds always dry, always under water, or wet enough to preserve a constant flow, do not give rot. Grounds newly laid down for pasture or exhausted by repeated crops, and also thin swards where the water remains in patches, cause the disease. A "vitiated dew," or a "gruft" adhering to the grass after wet, are considered to cause rot. Hard stocking is another presumed cause. In Ashford the swampy lands on calcareous tufa, near the river Wye, cause rot. Among the symptoms of the malady, yellowness of the eye and brisket, sudden improvement of condition followed by wasting, loss of wool, and swellings beneath the jaw, are those principally mentioned. As remedies, salt as a cure and preventive is most popular. Dry food is also recommended; and for the purpose of improving lands that are known to give rot, deep draining is suggested. A certain paddock in Norfolk, known for several years to cause rot, was drained, and animals pastured on it afterwards did not suffer. Iodide of iron, turpentine, and many other agents, have their advocates; but generally very little dependence is placed upon the action of medicines. In slight cases a change of pasture, more liberal feeding, including hay and crushed beans, with plenty of salt, have succeeded in effecting a cure. Rot is said to occur on some of the high and dry lands in Derbyshire; while, on the other hand, sheep have been known to feed for some time on wet land without suffering. In salt marshes, and by the sea-shore, rot is stated to be unknown. The clay-slate hills of North Devon, and also the commons of Dartmoor and Exmoor, claim to be equally exempt. The very singular case recorded of the meadow at Welbeck is authenticated in such a manner as to warrant its reception as a fact; but we have still to lament want of complete evidence. A certain ground badly drained, wet enough to produce flags and rushes, is nevertheless a good feeding-place, and for twenty years no rot occurs. Further than this, fair crops of hay are obtained without manuring; but the same ground, after being efficiently drained, produced one good crop; but never afterwards did the grass grow well, and animals fed on the meadow became affected with rot. To reason upon such statements is obviously impossible. If it be asked, why did the drained and improved land cause rot, when in its former undrained condition sheep fed upon it with impunity? it may be pertinently answered, For the same reason which prevented the growth of herbage that had always been abundant before the improvements were effected. What actual change took place in the soil and herbage we have no means of knowing, nor can we conclude anything in reference to them from the statement as it appears before us.

The disease is by some referred to feeding on particular kinds of plants, certainly possessing medicinal properties, and one of which belongs to a poisonous family; but a much more satisfactory solution of the matter is furnished by my colleague, Professor Buckman, who informs me that all the plants are inhabitants of boggy places—in short, of those very situations where rot is admitted to occur. Some of the causes advanced may be termed occasional; such as feeding on exhausted soils, or in places where the atmosphere is deteriorated by mephitic exhalations, or by the products of decomposition; sudden changes from high to low ground, or the reverse, hard stocking, feeding on medicinal or non-nutritious plants, or even the loss of the fleece. As all these circumstances affect the condition of the sys-

tem, we do not deny them a certain importance as "debilitating influences," although we cannot place them among the causes of the disease, as animals are frequently exposed to their action without becoming affected. Cases of disease are recorded as occurring under what may be called exceptional conditions. We are told, for example, that rot is produced on high and dry lands: in this statement nothing is said about the nature of the soil, its capacity for retaining moisture, its liability to passing showers, and its inequalities of surface. We can imagine some high lands to be very much less secure feeding-places than low ones, all the circumstances of soil and surface being taken into account. The assertion that rot never occurs on wolds is not an unqualified truth: it certainly happens in some parts of the Cotswolds, as it would in other similar situations were the circumstances favourable. Absolutely dry and well-drained lands are ordinarily healthy without reference to their elevation above the level of the sea. Further, it is asserted that sheep will feed in very wet meadows for some time without injury. Here, again, an apparent contradiction may be easily removed. A sudden flood of some continuance does not furnish all the conditions requisite for the production of the disease. If no stagnant pools are formed, no danger need be apprehended. In salt marshes and in the neighbourhood of the sea rot is unknown, probably for a variety of reasons.* Salt herbage has a beneficial medicinal action upon animals in general; a tonic and alterative effect—one particularly opposed to debility or typhus in any form. Salt is anti-putrescent, and vegetable decomposition is prevented or retarded under its influence. The immunity enjoyed by the "clay-slate" hills of North Devon and the commons of Dartmoor and Exmoor is merely a proof of their healthiness. The same statement might of course be made of hundreds of other situations in different parts of the world, since fortunately the dangerous localities are the exception and not the rule. As we are discussing the disease in reference to the sheep, it will not be necessary to extend the remarks that have been made upon the other animals that are its joint victims; to wit, hares, rabbits, and deer. Cattle in some parts of the continent suffer severely from the malady, and we have lately received reports of its existence among them in the West of England, although with our present system of feeding we do not anticipate any serious loss. The speculations upon the origin and influence of the "fluke," with the remarks upon symptoms and treatment, do not call for minute criticism here, as those points will engage our attention in due course. Finally, the results of our examination of the evidence may be expressed in the two following statements: Firstly, rot occurs in moist situations, after a warm rain has caused a luxuriant growth of herbage; secondly, rot does not occur in well-drained healthy lands, where the above conditions are absent.

Symptoms of Rot.—A tendency to fatten is the earliest sign of the disease, according to the concurring testimony of practical men. Various reasons are given in the attempt to account for this, but no one seems to controvert the position. The improvement in the bulk of the body is, however, of short continuance; soon the fatty textures are removed more rapidly than they were deposited, and an extreme emaciation, primarily affecting the region of the loins, is subsequently the prominent character of the disease. Very early in the affection, the caruncle at the inner corner of the eye becomes slightly tinged of a yellow or yellowish-white colour. The "clear red" or "pink" spoken of as indicative of health, we have scarcely ever observed; a clear white is the ordinary colour. The change, therefore, is not very marked, and requires close scrutiny, otherwise the ordinary tint may be taken for the paleness of disease. As the affection advances the yellowness becomes more marked, and affects the skin as well as the mucous membrane: the wool falls off, or is detached by a trifling force. Dropsical effusion takes place under the jaw, a fetid smell distinguishes the exhalations and excretions, and the animal dies from exhaustion, or is killed before the malady has reached its climax. Little or no difficulty is experienced in deciding upon the nature of the disease; a few fatal cases alone would suffice to settle the question, even if the peculiarities of season or locality had not already afforded grounds for an

* Among others the absence of fresh-water molluscs, in which the *distoma* brood are partly developed.—G. T. B.

opinion. The signs deserving most attention are the remarkable aptitude to develop fat, followed by rapid destruction of that tissue and general wasting.

Post-mortem Appearances.—In subjects that have died from the disease a singular flabbiness and louseness of texture is apparent. The areolar membrane is filled with serous fluid, causing this soddened appearance. Dropsy of the cavity of the abdomen is also frequently present; the firm red muscles of the healthy animal are exchanged for softened and pallid structure, although when the diseased subjects are killed and dressed in cold weather a great deal of this is disguised. A very small portion of fat is found in any part of the body, even round the kidneys; and what remains is tough and frequently tinged with yellow. The kidneys also partake in a remarkable degree of the generally diminished colour; the lungs are usually congested, sometimes markedly so on the side which the animal has lain after death; frequently extensive tuberculous deposits are seen. The liver gives in every case sufficiently clear indications of being the part most affected. In different subjects we find various appearances. In the incipient stages the gland is enlarged, and its deep chocolate tint is replaced by a bright yellowish brown, interspersed with bright crimson spots—ecchymosis. In the more advanced forms we have a mottled appearance, difficult to describe, consisting of a complicated mixture of a light brown or clay colour, with yellow, crimson, and bluish-white; sometimes the gland is shrivelled, and at others swollen, and occasionally the organ is found ruptured. The gall-bladder and biliary ducts contain a thick, muddy-looking bile, and floating in it the “fluke,” in very variable quantities, from isolated specimens up to countless numbers, the quantity not being always in proportion to the extent of the diseased condition of the liver. It is worthy of remark, that whatever may be the depth of colour mottling the gland, the ground colour, if we may so term it, is invariably lighter than natural: in reality, the liver, like other texture, suffers a diminution of its characteristic tint.

How far the liver is concerned in these morbid changes, the following remarks of Todd and Bowman may assist us to determine: “The question occurs to us, may the liver be a source of supply of blood corpuscles, or may it contribute to the production of hæmatine in adult life? It has often struck us that this question might be answered in the affirmative, while observing cases in which the process of the formation of blood seemed greatly perverted, where no organic disease could be detected beyond some degree of enlargement of the liver. Patients suffering in this way are pale, as if from loss of blood, although no such loss has been experienced; their nutrition is enfeebled, digestion impaired, and there is a slight yellowness of the complexion, as in cases of hepatic disease; and after death no lesion is discoverable but slight enlargement of the liver.” If the conclusion that the liver supplies blood corpuscles be true, all these symptoms are easily explicable, and a new light is thrown upon the pathology of rot. One point yet remains unsolved—the sudden aptitude to fatten at the commencement of the disease, and the equally sudden emaciation which succeeds. We have ascertained that the liver forms both fat, and, what is almost identical with it, sugar; further, we have seen that the presence of bile renders the mucous membrane more permeable to fatty matter. Hence, if it be conceded that the first influence of the exciting causes of rot is to stimulate the secretion of bile—and we have every reason, from the symptoms, to believe this to be the case—we perceive how a larger quantity of fatty matter may be appropriated at the outset; a continuance of the disturbance leads to defective secretion; the bile loses its healthy character; its colour, consistence, and properties are modified; it is no longer capable of assisting in those important changes by which the food is rendered fit for the purposes of the organism; in all probability neither sugar, fat, nor blood corpuscles are formed; and thus pallor and emaciation are accounted for. Thus by a chain of evidences, each one demonstrable or established by the researches of the most eminent physiologists, we arrive at certain conclusions. First: We ascertain that the liver is concerned, to an important extent, in the changes which matter undergoes during its assimilation; that it forms fat and sugar, and most probably blood corpuscles; and that the presence of its secretion, bile, in considerable quantities, promotes the absorption of fatty matters. Secondly: We ascertain that the disease of “rot” is at first characterized

by an excessive and unhealthy development of fatty matters, and in the next place by defective formation, not only of fat, but also of blood corpuscles, as indicated by emaciation and loss of colour. We find in the symptoms during life, and in the *post-mortem* examination, absolute evidence of disease of liver. We have proof that in man defective action of the organ is followed by paleness and emaciation, and coupling this with the physiological fact that an energetic secretion of bile is associated with the formation and absorption of fatty matters, the conclusion is inevitable that rot is a disease of the liver, consisting in—1st, Functional activity, or excessive secretion, leading to the formation or deposit of fat. 2ndly, Organic derangement, associated with perverted or diseased secretion, leading to defective nutrition, in consequence of the imperfect performance of those functions upon which the perfection of the constitution of the blood and the due supply of fatty textures depend.

In reference to the causes of rot, the sources of fallacy are innumerable. Whatever is observed in association with the disease seems to be generally assumed as the actual exciting influence. The opinions quoted at the commencement of our essay exemplify this position most perfectly. Some speculations are puerile, and deserve no notice; others are of sufficient weight to require some consideration. Among the latter the “fluke,” as an almost invariable accompaniment of the disease, ranks in popular estimation first.

In passing to a consideration of the influence of the fluke in the production of rot, we wish to preface that chapter with some few words from the German pathologist, Vogel, who, speaking of the effects of parasitic animals upon the body they inhabit, says: “The disease which accompanies their presence is, however, invariably either an effect of their presence, and is called into existence by the influence which they exert upon the organism, and by the reaction of the latter—or the development of the parasites is, in the manner formerly explained, first rendered possible by the presence of a disease; *the parasite should never be identified with the disease itself.*”

Influence of the Fluke in the production of “Rot.”
—The fact of a parasitic animal of whatever kind subsisting upon any part of the organism of another animal is so revolting to our feelings, that we instinctively associate disease with its presence, without pausing to inquire what are the evidences which justify such a conclusion. The range of natural phenomena includes nothing more remarkable, and certainly nothing more obscure, than this question of parasitic life. What function these animals perform—whether they are always productive of injury, or what part they play in the economy of nature—are points which deserve a profound consideration. In the course of an impartial inquiry into the circumstances under which they exist, we cannot avoid observing that they, in many cases, produce no obvious ill effects. The bot in the stomach of the horse is very rarely the cause of any disturbance; indeed, its presence is frequently unsuspected until the time for its expulsion arrives. We are aware of isolated instances of injury to the stomach; but speaking generally, no ill consequences ensue. Various kinds of worms infest the digestive organs of many animals; and, although some of them occasion disturbance, it has often occurred to us to discover immense quantities in the body of an animal which during life has given very little evidence of derangement. Hydatids in the liver commonly exist to a considerable extent, without occasioning any particular change in the function of the gland. In one very remarkable instance, lately brought under our notice, as many as ten of these cysts (*Echinococci*) were found, some of them as large as a good-sized orange. The horse had for years performed a fair amount of work; and beyond occasional temporary derangement, had shown no symptoms of disease. In the liver of the sheep, flukes are frequently found in connexion with an ordinarily healthy state of the organism—certainly without any of the indications that accompany rot. In estimating the liver-fluke as the principal cause of the disease with which it is associated, the mind merely obeys its natural bias: any evidence to the contrary will, therefore, be met by an instinctive opposition. We ask, however, for a little forbearance while we advance the arguments on both sides. In favour of the conclusion that flukes are the cause of the morbid changes, we have the fact of their presence frequently in large numbers in the livers of sheep affected with rot. In opposition to the conclusion, we have—1st, The fact that they are found where no appearances of rot are

seen during life, or after death. 2nd, The variation in point of number in similar cases of disease—sheep having died from rot with a dozen flukes in the liver, while in other cases hundreds are found. 3rd, Their presence is not necessary to the production of the changes observed. This position—of immense importance in the evidence—we had some years ago ample opportunity of verifying. A number of Southdown ewes were brought from a low and damp situation to the College Farm on the Cotswolds. Shortly after their arrival the symptoms of rot presented themselves: some of the animals died in a month or two; some lingered on through the lambing season; some were treated at the hospital; but eventually the whole number died at various times. All were submitted to a *post mortem* examination, and in no instance were flukes found, notwithstanding all the other signs of rot were well defined. We do not care to contend merely for the application of the term "rot" to these cases; we quote them as proofs of the statement we have just made to the effect that the various morbid changes characteristic of the disease may occur unconnected with "flukes." 4th, They are never found in large numbers, excepting in the advanced stages of the disease. If in the commencement they existed in abundance, there would be a presumption in favour of their having some influence in the production of the subsequent changes. Indeed, a large number of these animals could not exist in the biliary canals without interfering with the functions of the organ; but as they have not been found to precede, but rather to follow the disease, the presumption is in favour of their being to a greater extent the result of the derangement rather than its cause.

In fine, the weight of evidence seems to us so decidedly against the popular conviction, that we cannot consistently accept it. Allowing full force to the sole argument in favour of the belief, viz., admitting that flukes are invariably present in rot, it is not logical to conclude that therefore they are causes rather than effects—the mere fact of their existence being equally in favour of either presumption. In support of the opinion that flukes are not the essential causes of rot, the arguments may be concisely stated: 1st, Flukes do not occur in large numbers until the disease has made some progress. 2nd, The number is not invariably proportioned to the extent of the morbid changes. 3rd, Exactly similar, even identical, symptoms during life and *post mortem* appearances have been found to exist unassociated with the presence of these parasites. 4th, Flukes are found in the liver not only of the sheep, but also in other animals, without the concurrence of any symptoms of rot. From the whole evidence we draw the following conclusions:

1. The fluke (*Distoma hepaticum*), while yet in one of its transition forms, is introduced into the organism of the higher animals. 2. In a healthy condition of the system only a few of the *larvæ* reach their full development. 3. When the animal infested is placed under circumstances which occasion derangement of the secretive functions, particularly of the liver, the "*distoma* brood" is favourably situated for attaining its final and mature state, and, by excessive accumulation, assists in the production of the organic changes associated with the advanced stages of rot.

Causes Acting from Without.—If it can be shown that certain external circumstances are capable of acting upon the system in such a way as to produce the changes observed, we presume no necessity will exist for assuming other causes whose action is not so capable of demonstration. With the view of discussing the question how far these external conditions are likely to be concerned, we select one of the two conclusions at which we arrived after criticising the general evidence. "Rot occurs in moist situations after a warm rain has caused a *luxuriant growth of herbage*." In order to explain the effects of food thus rapidly developed, it has been assumed that the saccharine and starchy matters are excessive in plants so developed. The speculation is plausible, and in a measure explains the occurrence of the changes observed in rot; but to assume what chemistry can so easily prove seems to us unjustifiable, particularly when so much depends on the truth of the position. An extensive investigation, microscopic and chemical, upon the herbage and soil of meadows where rot occurs, is needed. In its absence, however, my colleague, Dr. Voelcker, furnishes me with the following important facts as the results of his own observations: "Plants rapidly developed—for instance, swedes grown for exhibition under the stimulating action of manures, also the herbage of

water-meadows—contain one-half less of solid matter than those more naturally produced; so that the assertion that there is more sugar or starch is at once negatived." The presence of a large amount of nitrogen has led to the belief that such plants are highly nutritious; but Dr. Voelcker finds a considerable quantity of this to exist in a peculiar half-elaborated condition, or, as he expresses it, "something between an organic and inorganic compound." Albumen and caseine are deficient, as also are starch and sugar; much of the nitrogen exists in the form of ammoniacal salts, and there is also a much larger percentage of water. Such food is evidently unfit for alimentation, with its excess of fluid and its deficiency of flesh-and-fat-forming principles, not to speak of the highly-stimulating ammoniacal compounds that are among its constituents. Thus, so far as chemistry has investigated, we find just grounds for the statement that, in the plants of those localities where rot is produced, there is sufficient to account for the symptoms and *post mortem* appearances of the disease. The sudden increase in the animal's bulk having no reference to healthy nutrition, we may ascribe to the primarily stimulant effects of the diet upon the liver and to the excess of water; a large quantity of bile we have already shown leads to the absorption of fatty matters. The continued consumption of the food will naturally soon induce derangement that may be irremediable, even although the pasture be changed. How large a quantity of this food is sufficient in different instances to establish an alteration in the function of the liver to the extent of producing rot it is impossible to say, but we have declined to accept that part of the evidence offered us upon the occurrence of the disease from a remarkably short continuance of the causes—to wit, a single feed of objectionable herbage. In our remarks upon the function of the liver and upon the pathology of rot we endeavoured, under the disadvantageous necessity of a familiar description, to explain how the derangement of the organ would be followed by the changes found in the disease. Under the head of "Causation" we considered the influence of the fluke, and, for reasons then given, were compelled by the nature of our evidence to exclude it from any primary share in the production of the disease. Subsequently passing to an examination of the food produced by the localities where the affection is common, we found reason to conclude that plants under such circumstances are deficient in some of their most important constituents, and that altogether they furnish the conditions requisite for the production of such changes in the functions and structures as have been invariably observed in the disease of rot. We are permitted to infer, therefore, that the primary and essential cause of rot is the consumption of food grown under circumstances which prevent its natural and healthy development, modify its composition, and virtually render it poisonous to the animal system.

TREATMENT OF ROT.

Our previous inquiries having made us familiar with the causes and characteristics of the disease, we experienced no difficulty in deciding upon the appropriate treatment. Nevertheless it by no means follows that a correct system of medicine should command uniformly successful results; on the contrary, a number of modifying agencies may combine to render such a system abortive. In the case of the sheep, we have to contend against the naturally defective tone produced by a highly artificial and inconsistent plan of breeding and feeding; the diminished tonicity renders the animal an easy victim to nearly every form of disease, and lessens the chances in favour of medicinal treatment. With the economic considerations that may complicate the question of treatment we have nothing to do. We are to assume that the cure of the disease is a matter of some moment, and accordingly proceed to suggest a plan of procedure founded upon our knowledge of the causes and nature of the disease. First, to remove the animals from the locality where the malady is produced is of course an indispensable step; a high, or rather perfectly dry situation, where the herbage is healthy and fully grown, is desirable; where the appetite is good, a full allowance of food may be given. Good hay, oats, linseed, and beans, properly crushed, are found practically to be most useful. Medicinal treatment should be directed to the support of the respiratory functions, the restoration of the impaired biliary secretion, and the removal as far as possible of the numerous flukes which obstruct the gall-ducts, and thus add to the derangement. The first object, the supply of material for the respiratory

function, is attained by the exhibition of agents rich in the carbonaceous element: the condition of the patient definitely shows a deficiency of carbon, and a consequent defective calorific process. In all cases where such defect is present, the hydrated carbons are found of great value. Thus, turpentine, naphtha, glycerine, and cod-liver oil, act principally by supplying the required element—carbon—in an available form. These various agents may be considered to possess an equal value in this respect, and may be used alternately. Turpentine and naphtha are more stimulating, and hence may be used for cases where much prostration is present. A dose of two drachms of either drug may be given at first, combined with an egg or linseed emulsion, three or four times a day, the quantity being gradually increased as the animal becomes accustomed to the action; the effect upon the kidneys being carefully noted, although little apprehension need be felt, as in such cases animals bear enormous doses with impunity. Glycerine and cod-liver oil are much less actively medicinal, and may be given in almost any quantities in the food or by the drenching-horn. Half an ounce to an ounce, twice or three times a day, will generally be sufficient. Where turpentine or naphtha prove too stimulating, the other agents will be effective and safe substitutes. Salt as a remedy stands high in popular estimation. Of its preventive effects we entertain a strong opinion; but as a specific for the cure of the disease when fairly established, we think very lightly of it indeed. In our hands it has not proved itself a very effective medicine. As an ordinary condiment, its alterative action is beneficial; and it may, therefore, be used with the diet throughout the treatment: but, alone, we caution the farmer not to depend upon it. In the attempt to restore the perverted functions to their pristine condition, a number of means will suggest themselves to the practitioner—for example, taraxacum, for its effects upon the liver and kidneys. The compounds of iodine and chlorine, and also charcoal, for their antiseptic and tonic properties, will be at various times taken advantage of. The diminution of the number of flukes will in all probability follow the restoration of a healthy condition; besides which, the various agents indicated will further the end. The frequent use of camphor, in the form of vapour, would, we have no doubt, be advantageous; but, excepting in the Turkish bath, we have no means of so fumigating a number of animals. Under any system of treatment, we have reason to believe that a large per-centage of fatal cases will occur; and, as far as our experience extends, the question of "cure" gives way to a more important one—viz., that of "prevention."

PREVENTION OF ROT.

The second conclusion at which we arrived, from a review of the evidence placed before us, at the commencement of our subject, furnishes some important suggestions. If it be true—and there is no reason to question it—that rot never occurs on well-drained lands, where no excess of moisture is present to stimulate the herbage to a precocious development, we have at once the proper course indicated to us. Short of deep draining, we can conceive nothing that is likely to be successful. Partial draining has proved injurious, by removing the flood which prevented the rapid growth of grass, and leaving the moisture stagnant at the roots, and thereby promoting that unhealthy exuberance of which we complain. The free use of salt, with a varied and, as far as may be, dry and nutritious diet, are means that the farmer should not neglect to use in seasons like the past one, during which the large amount of wet might well have sufficed to injure even the most healthy grounds. Under such unfavourable circumstances, the healthy or unhealthy condition of the flock will much influence the number of animals attacked. To provide, therefore, as much as possible against such an emergency, extra expense must not be spared in the attempt to render the system non-susceptible to the influence of the causes of the disease. If our conclusions upon the nature of those causes be correct, there can exist no question about the best preventive measures, although there may be considerable difficulty in carrying them into effect. It is certainly easier to insist upon the propriety of converting bogs and marshes into healthy pasture, than to effect their conversion; nevertheless, we can no more escape the necessity than we can escape the conviction that, without such a change, thoroughly effected, rot will continue to exist, and devastate our flocks. The matter assumes a national importance, when we reflect

not only upon the loss to the agricultural community, but also upon the probable consequences to the public health. If, during the past season, "thousands of sheep" have been destroyed in consequence of the disease, and carcasses have been sold from 5s. or 10s. up to 30s., the inquiry as to what has become of that enormous mass of diseased meat is a serious one, albeit one not difficult to answer. A number of momentous points press upon us in considering the extraordinary prevalence of rot and other diseases among sheep: year by year the conviction becomes stronger that the animal grows more and more subject to these maladies. Nor can we doubt but that the emergencies of the present highly-artificial system of farming are constantly acting to increase the susceptibilities of his system. For example, the cultivation of a remarkable precocity in the breed, the necessity for exposing the animal to atmospheric changes in his ordinary position on the farm, the deteriorating effects of stimulating manures upon those plants which are the staple articles of his food, are circumstances which inevitably influence the predisposition to disease. How far they are capable of modification let the British farmer decide; at least he cannot afford to contemplate their existence with indifference.

The occasional extraordinary prevalence of rot, as during the last few months, is a circumstance of great significance in relation to the essential cause of the disease. On some land rot is an apparent necessity, an invariable result of feeding upon its produce. On large tracts of soil in France, Belgium and Germany, the disease is constantly present, and in some pastures in our own country the same thing is observed. The presence of stagnant water in all these situations, at one and the same time will explain the existence of flukes in the liver and the peculiar growth of the herbage to which we have ascribed so much of the primary derangement. As the conditions for the development of the embryo of the fluke, and the conditions for the precocious and unhealthy growth of the grasses, are both found in the invariable moisture, it becomes exceedingly difficult, perhaps impossible, to decide between the food and the entozoa—which of the two may exert the greatest influence in the production of the disease; while it is evident that the presence of the entozoon is, in such localities, very probable, even if we admit, which we do not, that it has nothing to do with morbid conditions. The occasional ravages of rot are associated with abundance of wet falling in situations where it may become stagnant; in situations, however, which did not previously favour the occurrence of the disease, and which will probably hereafter be exempt from such an unfortunate peculiarity. Under these not uncommon circumstances, if we accept the effects of the wet upon the herbage, and upon the temperature and composition of the atmosphere, as primary causes of the disturbance, we have no difficulty in accounting for these occasional outbreaks. The number of flukes found in the liver we have explained by referring to development of the larvæ under the, to them, favourable conditions of the disease; the distoma brood is most likely largely supplied by the water of small stagnant pools to which the sheep have access. If Steenstrup could distinguish thousands of *cercariae* in the water in which he had kept specimens of two of our largest fresh-water snails (*Planorbis cornua* and *Limnaeus stagnalis*), there is surely no difficulty about the quantity of germs, nor anything marvellous in their development under favourable circumstances. The distoma brood may be swallowed commonly by healthy animals; but in consequence of the absence of that peculiar condition of system under which they flourish, the majority may die and leave only a few representatives which do no mischief, and are not even suspected to exist until found by the butcher. If we decline to accept this solution of the question, we are forced to receive the other, viz., that the fluke is the essential cause of rot; this view is not difficult to defend, so long as the arguments refer only to the occurrence of rot in localities where the requisite conditions, as we have remarked, are constantly present; but, if we extend our observations to the case now under discussion, viz., the occasional production of rot, in wet seasons, upon grounds previously free from it, we incur the onus of accounting for the sudden presence of the "distoma brood" in a new situation. We cannot assume that the ova of the fluke are developed in these places where in dry seasons they would have withered, because, however probable this suggestion as to the effects of the moisture upon the ova, it must be remembered that we have no origin for these latter

in the lately-fallen rain; it is certainly possible that the ova of the *Monstomum mutabile*, infesting the eyes of some aquatic birds, may be the originals of the *Distoma hepaticum*; the ova may be dropped in these spots, now favourably circumstanced for their development, and thus infect the sheep. The hypothesis seems, however, rather *ad captandum*, although we do not at this moment see any other mode of escaping from the position in which we are placed by the reception of the assertion that the *distoma* is the primary cause of rot. In our therapeutic and prophylactic measures we have not sought to underrate the influence of the entozoa in the production of subsequent changes in the animal organism; nor should we depreciate the value of any means directed against the existence of the *distoma* brood or the destruction of their habitats, but we take leave to suggest that such means would only be beneficial in the future; the outbreak of the disease is not the moment when they could be advantageously applied, nor indeed can we expect much from any measures of the kind, even if adopted as soon as a large amount of rain has excited apprehension; sheep, according to our view, have already taken the germs into their systems, and only a certain condition of the secretions is necessary for their full development, and hence destruction of the larvæ outside the body will not prevent, although it may limit, the disease. From what we know of the entozoa there is reason to believe that cold would be very destructive; and salt is particularly so to fresh-water molluscs which the *distoma* inhabit; consequently it is probable that a freezing mixture, in which salt shall be a prominent constituent, spread in quantities over the ground, will suffice to exterminate the *distoma* brood for the time; but if the farmer hopes to prevent rot without an effectual drainage and restoration of healthy herbage, we fear he will be disappointed.*

For the present we take leave of our subject, in the hope that the interest excited will not diminish until something active has been done to remove this satire upon our agriculture. Experiments on a large scale directed to the prevention and cure of the disease are not difficult to devise or to conduct, so that opportunity be afforded; and the farmer, who is the principal sufferer, will hardly neglect to avail himself of whatever means promise a future security.—G. T. B.

NOTE.

However interesting the inquiry may be into the cause of the coathe or bane in sheep, and however astonishing may be the revelations contained in Professor Brown's paper on the natural history of "the fluke," practical farmers will ask, What is the result of this inquiry, and what suggestions does Professor Brown offer either for the prevention or cure of the disease? Any facts, therefore, that bear on this branch of the subject will probably be considered useful. 1. Professor Brown considers that the disease called the bane, coathe, or rot, never occurs on thoroughly well-drained soils. In spite of here and there some apparent instances to the contrary, I believe that Professor Brown is right in this opinion. In a letter which I received a short time since from Sir Alexander A. Hood, Bart., on this subject, he mentioned that his estates at Butleigh, in the county of Somerset (which are upon the lia formation, and which he remembered to have been in his boyhood often visited by this destructive disease, causing great periodical losses to the tenantry), had been during the past year almost entirely exempt from the disease. The only reason for such exemption that he was able to assign, was the fact that he had pipe-drained the whole of these estates since he came into possession of them, and had cut down a large quantity of timber that had previously overshadowed them. I also have had a somewhat similar experience on a smaller scale. About four or five years ago I pipe-drained forty acres of fine marsh-land in the parish of Burnham, Somerset, called the Haviges. I am informed that nearly all the sheep in the parish of Burnham have been banded during the past year. When my tenant took his sheep to market in the autumn the extensive prevalence of the bane on the lands surrounding the Haviges was alleged as a reason why his sheep must also be banded, and why therefore they should be sold at an unsound price. He, however, believed them to be sound; and to settle the question, offered to have one of them killed on the

spot. This was done. The sheep proved to be sound, and the rest of the flock were sold as sound. 2. Professor Brown suggests as the best mode of treating the disease—1. Removal from the locality where the disease has been contracted. 2. A full allowance of food. 3. Hay, oats, linseed, and beans (he says) have been found practically useful. 4. The following facts will corroborate this opinion; Lieutenant-Colonel Henry A. F. Luttrell, of Badgworth Court, Somerset, bought 158 long-wooled wether sheep in the spring of 1860, and grazed them on pasture land partly pipe-drained and partly not drained. They cost 42s. each on an average. He had them shorn, and as they got fat sold them off. The best of them were sold at good prices during the summer and the early part of the autumn. About the middle of November there were ninety left which were not fat enough to be sold, and were, in fact, all banded: forty of the worst of them were sold in November for 28s. each, and he was offered 34s. each for the remaining fifty. This offer he refused. He then put these fifty banded sheep on some pasture land which had been pipe-drained, and had been fed down bare, and kept them on oil-cake, pulped swedes, and a few beans. They ate 2 tons of oil-cake, which cost £26, about 25 tons of swedes, and 4 bushels of beans, and also a small quantity of hay during the severest weather. Week by week one of them was killed for the house; and generally one was selected which appeared to be doing the worst. Every sheep that was so killed was banded. On the 12th January, the 5th of February, the 4th of March, and the 22nd March, the sheep were weighed, and found to be on the whole increasing fast in weight, though some two or three on each occasion had lost weight. I have not the particulars of the weighing on the 12th January. From the 5th February to the 4th March the aggregate increase of weight on the 39 sheep that then remained was 217 lbs. Five of these 39 had, however, lost 20 lbs. in aggregate weight since the previous weighing. From the 4th March to the 22nd March, 37 of these sheep that remained at the latter day had gained, in the aggregate, 111 lbs. since the previous weighing, though three of them had lost, in the aggregate, 14 lbs. During part of this latter period oil-cake had ceased to be given, and the sheep had been put on grass over which ewes and lambs had a first run. One of these 37 was killed for the house, and the remaining 36 were sold on the 25th March for £106, or 59s. each. The following is the result of the experiment in money:—

	£	s.	d.
36 sheep sold for.....	106	0	
14 sheep killed, averaging 18 lbs. per } quarter, at 7½d.		31	10
			137 10
Cost of oilcake	26	0	
Cost of beans	1	4	
25 tons of swedes, at 8s.	10	0	
Hay, 10 cwt., at 3s.	1	10	
Value of 50 sheep in Nov., at 34s.	85	0	
			123 14
Profit besides manure.....			13 16

If any other experiments of this kind have been made during the past year, it would be desirable that the results of the same should be communicated.—G. S. P.

PROPOSED NORTH HANTS AGRICULTURAL SOCIETY.—Some of the leading agriculturists of the district having mooted the desirability of establishing a society of this description, a public meeting was convened on Wednesday, May 15, Basingstoke, when, from the large and influential attendance, there can be no doubt that the object of it will be fully attained. Mr. Portal took the chair, and warmly advocated the object in view. The first resolution, embodying the constitution and objects of the society, was moved by Mr. Portal, seconded by Mr. Francis Budd, and unanimously adopted. The objects are the encouragement of breeding stock of all descriptions, the improvement of root crops, rewarding the skill and industry of labourers in ploughing, hay tying, and the various departments of husbandry. The selection of W. L. W. Chute, Esq. of The Vyne, as president for the first year, was hailed with great satisfaction; and at the close of the meeting about 46 gentlemen present enrolled themselves members.—*Hampshire Chronicle*.

* It has been objected that this plan, unless carried out sufficiently to destroy the herbage, would not be efficient: we shall admit the force of this objection after the experiment has been tried.—G. T. B.

A WEDNESDAY AT THE ROYAL AGRICULTURAL SOCIETY'S ROOMS.

[FROM A CORRESPONDENT.]

It may not be generally known, as the advertisements say, that on every Wednesday of the month, except the first, during the months that the Council of the Royal Agricultural Society hold their meetings, at noon, ordinary subscribers are admitted to the sacred precincts of Hanover-square, and permitted to read short papers, make speeches, and ask questions on agricultural questions, just as at the meetings of the Geographical, the Statistical, the Institution of Engineers or of Architects the subjects to which those associations direct their special attention are described and discussed; but with this important difference—all other learned or scientific or literary societies holding discussion meetings, either have recorded in shorthand notes and periodically publish reports in their transactions, or admit the press. Many societies, including some of the most flourishing and influential, do both. They allow the press to make public reports of discussions of popular interest, and they supply their members with authentic records, in a convenient shape for binding, of those discussions sufficiently important to be of permanent interest. The Council of the Royal Agricultural Society adopts neither of these plans; in fact, it adopts no plan at all for its Wednesday Meetings, and no rule except the rule of rigidly excluding reporters. The agricultural papers are seldom favoured with any notice of the subjects likely to come on for discussion. The result may easily be anticipated: the meetings generally consist of the Members of Council detained by committee duties, two or three officials, and a stray member or two whom accident or acquaintance for the man about to read a paper draws to Hanover-square. Nine out of ten of these Wednesday meetings closely resemble the Protestant Church in Ireland, where Dean Swift began the service with "Dearly beloved Roger"; and of which Sydney Smith told the story beginning with, "Please your reverence she's sick."

Perhaps the last open weekly meeting in May was as fair a specimen as could be found of an unusually lively day at Hanover Square. A little before twelve o'clock Members of the Council began to descend the stairs, and depart in evident haste and trepidation; for there was a rumour that Mr. Edwin Chadwick, with a large bundle of papers and Italian rye-grass, was waiting in the secretary's room for the moment when he might use his privilege and repeat, for the hundredth time, his story of the virtues of liquid manure and the value of sewage. The Journal Committee were amongst the first to vanish; Mr. Thompson was followed by Mr. Wrenn Hoskyns, and Sir J. B. Johnstone; Sir Watkin W. Wynn mounted his weight-carrier, and paced away with the grim satisfaction of a man who has "escaped"; others less known to fame followed; and when the summons of the door-keeper admitted us to the council-chamber there was Lord Berners in the chair, supported, of course, by Mr. Raymond Barker, looking fresher and more persevering than ever; there was the secretary at his desk, and the editor of the Journal at his post; Mr. Brandreth Gibbs, the honorary manager of the Society; Professor Symonds, the veterinary-surgeon; Mr. Fisher Hobbs, who was waiting for a committee, which followed the discussion; the Earl of Essex, who has a sewage-manure farm; Mr. Barrow, M.P., who has lately resigned a seat in the Council, for which he is much better qualified than some who

remain; Mr. Holland, and Lord Cathcart, who have recently been elected on the Council; Mr. Chadwick, the Attorney-General of Liquid Manure, and his witness, Mr. Blackburn; together with Mr. Dickenson, formerly of Willesden, and now of New Park, who imagines he invented Italian rye-grass.

Mr. Chadwick, wise in his generation, had his paper in print, ready to be issued as a pamphlet, with all the authority of a "Paper read before the Royal Agricultural Society." The novelty of the paper consisted in the one circumstance that Mr. Chadwick had, at the end of seventeen years, found a new witness to the extravagant value he puts on his universal medicine for agricultural success.

At least seventeen years ago experimental agriculturists found that in England, as well as under the sun of Italy, the application of liquid manure would produce greater crops of grass than any other process, especially if applied immediately after cutting. And it was also found that the heaviest crops of all could be grown from Italian ryegrass, then recently introduced into the English seed market by Messrs. Lawsons, of Edinburgh. About that time, bevises of agriculturists used to resort to Willesden, to see the large crops of Italian ryegrass grown by Mr. Dickenson, the jobmaster, for the use of his horses, without regard to the cost of horse or men's labour, just as boys grow mustard and cress on a sponge. Italian ryegrass has been established as one of the useful seed crops of the British farmer. An account of the steps by which it became popularized will be found in the report of a paper read at the Central Farmers' Club by Mr. Chalmers Morton, in March, 1855. Thus seventeen years ago we arrived at this agricultural fact—that if you have a consumption, say by a dairy or stable of horses, for Italian ryegrass, and can economically collect and apply liquid manure or wash in solid portable manure, you may thus obtain heavier and more frequent green crops than in any other manner. And in the present day, after tens of thousands of pounds have been spent on experiments on the largest scale, we have not got any further. But on these simple facts, Mr. Edwin Chadwick, then occupying an influential official position, founded a school of agricultural reformers, consisting, it must be admitted, entirely of amateurs. This school—like that founded by the late Mr. Morrison, President of the Pill College of Health—had only two axioms, and both of remarkable simplicity; the difference being, that Morrison advertised at his own expense, while the Board of Health advertised its new theories of agriculture in thousands of Blue Books at the expense of the nation. These axioms were, first, that the most profitable mode of applying manure of every kind was in a liquid form; secondly, that liquid sewage of the towns was of enormous agricultural value, of a value sufficient to justify the execution of costly works for its delivery in the agricultural districts, and a large rent from farmers for its use. Unfortunately for Mr. Chadwick's agricultural reputation, the experience and the experiments of seventeen years have not borne out his confident theories. Capitalists have been found, farms have been piped and deluged, enormous green crops have been grown, the triumphant results of the new system reported far and wide in official Blue Books and copied into newspapers. Mr. Chadwick

has lectured, made reports, written letters, made speeches, and still the farmers of England and Scotland are as far as ever from adopting the universal liquid system. The amateur pipe farmers disappear one by one, the pipes are neglected or sold for old iron, and the failures become as numerous as those of the dandies in the days of starched cravats; but, less fortunate than Beus Brummel, Mr. Chadwick has never yet found the "perfect tie." In 1844 Mr. Chadwick's Board of Health published a list of some dozen liquid-manure farms in operation or about to be worked. Of these one only remains in operation: worked for the amusement of a Liverpool merchant at Liskeard, to grow Italian rye-grass, and worked avowedly without a view to profit. Then Mr. Alderman Mechi's farm did duty with Mr. Chadwick's papers, until the Alderman at the Central Farmers' Club was obliged to admit his large use of solid manure. Then the Scotch farms described, in 1855 by Mr. Chalmers Morton, were held up as an example of the success of the exclusively liquid system, and continued to be quoted as examples of success by the Chadwickian school after they had ruined their proprietors and been reduced to the simple function of growing a small breadth of grass. Then Mr. Walker's liquid-sewage farm at Rugby became the leading example of modern model farming, to which the attention of the Emperor of the French and of all the philosophers of a scientific congress was specially called. But after a few years experience it is found that the results of the Rugby farm will not bear close investigation and Mr. Chadwick's tone of admiration for that example is turned into something very like contempt. Then there was the case of Mr. Chamberlaine of Norwich, a wealthy retired tradesman, who, inspired by Mr. Chadwick's writings, consulted Mr. Mechi, and fitted up a liquid-manure farm in Norfolk on the most approved model; which, however, after a few years proved so total a failure that the system was abandoned, and the pipes sold for old iron. Still more lamentable was the failure of the French farm of Vanjours, which was established with Government assistance in hard cash by a joint-stock company, directly inspired by Mr. Chadwick. Mons. Mille, the enthusiastic director, consulted him at every stage, and rejected the more prudent and practical advice of Mons. Barral, who had seen reported the failure of the Scotch farms.

The farm of Vanjours has, up to the present time, been carried on at a total loss, and, what is remarkable, a loss on every crop except Italian rye-grass.

Mr. Blackburne is Mr. Chadwick's last hope. He is the witness called to testify to the success of what has failed with every one else. We require time and opportunities for cross-examination before we accept as agricultural truths the result of his answers to Mr. Chadwick's leading questions. Solon told Cærus that no one could be "pronounced happy until dead." With examples in England and Scotland of the great pace at starting and very ignominious ending of liquid manure farms, we must wait awhile and know more of Mr. Blackburne before we put a value on evidence which, no doubt he tenders in perfect good faith.

Under the curious arrangements of the Council of the Royal Agricultural Society, all Mr. Chadwick's assertions and Mr. Blackburne's statements will be circulated as freely and fully as Prince Napoleon's late famous speech; but the discussion that followed was, in the absence of reporters, as much lost as if it had been a private conversation. The Earl of Essex reported his success in growing grass with the sewage of Stratford. An authoritative report of his observations would have been really valuable as a foundation for further inquiry. On corn he had only made one experiment. He manured one

acre of land with liquid sewage, and left another acre of land entirely without manure. The result was, a net profit of £1 2s. 6d. on the manured over the unmanured portion. It is scarcely necessary to observe to farmers that an experiment of a single crop on a single acre proves nothing, except the necessity for further experiments on a larger scale. Mr. Dickenson repeated his often-told accounts of his great crops of grass at Willeden, but admitted that at New Park he farmed for amusement, and (wisely) kept no accounts, and that, although under his lease he was entitled to have the 250 acres of his farm piped, he was content to work two small plots of twenty and twenty-five acres, close to his house, for the sole purpose of growing Italian ryegrass, thus completely bearing out the arguments of those who have opposed the exaggerations of the liquid manure theorists. Mr. Sidney said that Mr. Chadwick assumed that the adoption of liquid manure, in lieu of solid, was due solely to the prejudices of farmers; but if that was so, Mr. Chadwick was alone to blame, for he had, during seventeen years, from time to time recommended first one and then another liquid manure farm as an example for the imitation to British farmers, and from some cause or other, each of these farms had failed or ceased to be worked, until he (Mr. Chadwick) was left with his latest examples, Mr. Blackburne and the Earl of Essex. This proved that whatever the theoretical excellence of the liquid manure theory might be, the practical difficulties were enormous. It was absurd to assert that the modern farmer was opposed to improvement, when in the last twenty years he had eagerly adopted two such costly improvements as deep-draining and steam cultivation, besides spending millions in artificial manures.

And so ended the Wednesday meeting! Every one who has had any experience of agricultural discussions must have observed that valuable observations are constantly contributed by practical men, who are unwilling to prepare a formal paper. The arrangements of the Council of the Royal Agricultural Society waste such observations on half-a-dozen auditors, and defer, under the mistaken notion of increasing the interest of the Journal, valuable papers, until they have lost half their value. The Wednesday meetings, arranged on a systematic plan, and opened to the press, would do more for the circulation of useful agricultural facts than a pyramid of ponderous essays on the agriculture of Denmark, or France, or Heligoland.

[Some of the remarks of our correspondent may be considered a little severe, but to show how general is the feeling as to what he complains, we may quote here the opening sentences of the opening leader of the *Gardener's Chronicle*, of only last Saturday: "The lectures at Hanover-square, before the Council of the Royal Agricultural Society, are a mistake, unless they be allowed immediate publication. What good purpose is served by letting twenty people into the secret history just unravelled by the scientific man of any particular branch of agriculture? If they were twenty farmers in extensive business, some service would indeed be done; or twenty representative men, from the districts interested in the subject, might at once turn fresh knowledge to account, or subject it to those tests which it must in the first place stand before it can be utilised. But twenty noblemen and gentlemen, and these not tenant-farmers, were no fit audience for Professor Voelcker last week; and seeing that we are not allowed to publish his remarks, they might have safely been delayed without injury till their publication in the Journal." Another paragraph tells what they think in Ireland of the system.]

A paper of great practical importance has been read at the

recent monthly meeting of the Central Farmers' Club, and we would ask no other evidence of the value of such discussional meetings than that which has been afforded by the London Club during this and the preceding month. In this respect, indeed, the club is unequalled. There is occasionally a valuable paper brought forward at some of the council meetings of the English Royal Society; but as these are for the most part reserved until the publication of the Society's *Journal*, they are a sealed book to most people. Professor Simonds' lecture on "Rot in Sheep," which we recently transferred to our columns, was an exception to this absurd rule; but it was so only in consequence of the hard fight made by some members to have it published at once, with a view to its immediate dissemination through the country. Again, we sometimes get something very good from the reported meetings of the Highland and Agricultural Society, although not nearly so often as we once did, discussional meetings apparently being held less frequently by that society; whilst our own Royal Agricultural Society is, in this respect, truly "the silent sister." Under such circumstances, we always turn to the reports of the proceedings at the Central Club, as these appear in our London contemporaries, with pleasure, satisfied that we shall always find in them something worthy of attention. This is particularly true in the case of Mr. Owen Wallis's paper on "feeding stock on pasture-land in spring, summer, and autumn;" and as we are not desirous of lessening its effect in any degree, even by epitomising it, we give it in full.—*Irish Farmers' Gazette*,

to exhibit at the Smithfield Club, and for which there was no competitor last year—the premiums remain as they were. After the business of the Society was ended, it was announced that the committee appointed by the Royal Agricultural Society of England to revise the district country meetings of that Society had selected a district including this county for their meeting in 1863, and that we were that day receiving the valuable aid of Mr. C. Wren Hoskyns, one of the vice-presidents of our Committee, at their Council Board in supporting the selection. It was resolved that the meeting stand adjourned, to receive that gentleman's report.—*Hereford Times*. [It is understood that the selection for 1863 will rest between Hereford and Worcester.—EDIT. F. M.]

"STANLEY ROSE."

(FROM THE "IRISH FARMERS' GAZETTE.")

Alas! alas! the woeful news,
 Poor Stanley Rose is dead:
 Ah, woe betide that fatal walk
 She took through Holyhead.
 From point of tail to tip of nose,
 No fault hadst thou, sweet Stanley Rose!

She left her stall at Branches Park,
 So lovely and so fit,
 That each one vowed she'd lick the lot
 At t' show in land of Pat;
 But what's to happen no one knows;
 No more didst thou, my Stanley Rose!

The railway truck got off the line,
 The road was very hard,
 She had to walk, and sorrowful
 Was honest Johnny Ward:
 Those nasty flints, they pinched thy toes,
 And shook thy frame, poor Stanley Rose!

In spite of ail, her beauteous shapes
 Could easily be seen,
 And placed her first, though 'gainst her was
 A "Duchess" and a "Queen."
 The worthiest prize the judges chose
 To give to thee, sweet Stanley Rose!

But though well plied with corn and cake,
 And sedulously tended,
 Alas! alas! at Branches Park
 Her brilliant course was ended.
 Alack-a-day! no doctor's dose
 Could save thy life, poor Stanley Rose!

MORAL.

So if you've got a heifer prime,
 Now don't you go to spoil her
 By feeding high, for if you do,
 She'll likely burst her boiler;
 And, after all, I do suppose,
 'Twas that which killed poor Stanley Rose!

HEREFORDSHIRE AGRICULTURAL SOCIETY.—

The Committee of this Society met at the City Arms hotel, for the purpose of passing the accounts of the past year and revising the list of premiums to be offered for the ensuing show, when it appeared the funds still continue inadequate to the wants of the Society, and from the lamented death of one of its patrons, the Right Hon. Lord Berwick, and several others of its members, it became obvious that one of two things must be resorted to, viz., either to restrict the premiums, or devise some other means of increasing the annual income. The former course was considered very inadvisable, and it then became a question what was to be done, when a suggestion made by Mr. Duckham was unanimously resolved, viz., to admit the public to what is termed a private view, on payment of 2s. 6d. each, during the day on which the animals are being judged. It is confidently hoped this arrangement will induce some of the fair sex to grace the yard, as also many persons who have hitherto been unable to attend, in consequence of the other numerous engagements upon the show-day, which has of late years become a most important day of business, being, with the exception of the day following, the largest fair day in the year for the sale of cattle. Here we may, perhaps, be allowed to remark, we almost question whether in a few more years that will not be the general fair day for horned stock, and the present fair day become one for horses, sheep, and pigs only. With the omission of class 12—a premium of 5*l*. for the best ox or steer qualified

THE LATE DUKE OF BEDFORD.

THE DUKE of BEDFORD, who had for some months past been in declining health, died on Tuesday, May 14, at Woburn Abbey. He was the eldest son of John, sixth Duke, by his first marriage with the Hon. Miss Byng, second daughter of the fourth Viscount Torrington. He was born May 13, 1788, and married, August 8, 1808, Lady Anna Maria Stanhope, eldest daughter of Charles, third and late Earl of Harrington, by whom, who died in July, 1857, he leaves issue an only son, William, Marquis of Tavistock, now Duke of Bedford. The deceased peer was educated at Westminster School, whence he removed to Trinity College, Cambridge, to complete his studies. Before he graduated as M.A. in 1808 he had gone the tour of Europe, as customary in those days. On his return to England he entered the House of Commons as M.P. for Bedfordshire, which county he represented in six consecutive Parliaments, until he was summoned in December, 1832, to the House of Lords in his father's barony of Howland. On the death of his father, in October, 1839, he succeeded to the Dukedom. In 1852 he was appointed Special Deputy-Warden of the Stannaries, and on the death of the late Earl de Grey was made Lord Lieutenant of Bedfordshire. In 1846 he was made a member of the Privy Council, and the year following a Knight of the Order of the Garter. On the death of Lord Macaulay he became High Steward of Cambridge. By his death the extensive estates belonging to the house of Russell in Bedfordshire, Devonshire, Herts, Cambridgeshire, and Middlesex, as well as the titular honours, devolve upon his only son, William, born in 1809. The present Duke was M.P. for Tavistock from 1832 to 1841.

Just as Agriculture is beginning to rejoice under the approving smile of Royalty itself, she turns aside for a moment to mourn the loss of a true friend. And right worthily may he who has just left us ask the tribute of a tear. He was a good man, who used his great means in doing great good to those around him. Descended of a noble race that has long stood high in the annals of Agriculture, his own unchequered career of usefulness will eclipse even the fame of his ancestors. Seldom has a man worked so steadily onwards. Rarely has any one left so many lasting monuments to his memory. At every turn wheresoever his path was followed, you saw what a blessing it was for the poor to own such a friend, the tenant to boast of such a landlord, and the gentry to feel the force of such an example. The blocks of clean comfortable cottages—the complete well-finished homesteads—the thriving schools, and the spiring churches—either alike in town or country, there is that record of him that the sculptor's art or the poet's pen will seek in vain to vie with. The Duke of Bedford has done his duty in that state of life in which it pleased God to place him. The charge was, no doubt, a heavy one; but he ably fulfilled it.

This is a high character; but it is an honest one. Regarded strictly as a landowner, there is perhaps scarcely such another illustration of his order as the late Duke of Bedford, now left amongst us. *Liberality*

and *Management* were the watchwords of his system; and amply indeed did it succeed. His Grace's own home-farm was a very model for others; and an eminent agriculturist from a distance, who went over this only the day before the Duke's death, was alike gratified and surprised—at having seen such a farm, and at having previously heard so little of it. Then so perfect in their way had the Woburn holdings become, so well were the occupiers started and treated, that the very fact of being a tenant on the Bedford Estate gave a man a name and a standing. One amongst them, who but a few years since thought he required a new range of farm-buildings, was invited to go through the country, and to see what he should like; and having made his choice, some of a similar description were erected for him. But there was method in all this liberality; and the Duke's property had with every justice the repute of being the best-managed estate in the Kingdom. Much as his Grace did himself towards this, excellent man of business as he was, he was ever well represented; for few agents have ever more fairly earned the esteem he has than Mr. Bennett, while it is not often that two such farm stewards have been found, the one to follow the other, as Mr. Baker and Mr. Coleman. If you may judge of a man alike by his works as by those about him, then did the Duke of Bedford deal discreetly with the talent with which he had been trusted.

If we search further, we only find what is already famous. The home farming in the park may not be so well known to all as it should be, but the housing of the labouring man has long been held up as the example for others. The Duke of Bedford spent upwards of sixty thousand pounds in building cottages for the labourers in his native county, and he hit the happy medium in doing so. They were not too good nor too costly for their actual purpose. The Royal Agricultural Society published plans of them; the *Farmer's Magazine* gave prints of them; and the *Quarterly Review* wrote essays on them in this wise:—"As they embrace, moreover, every variety of ordinary cottage accommodation, none have been published, even by professed architects, so useful to the country builder as those which emanate from the study of Woburn. The Duke has been as conspicuous in his deeds as in his plans. He has erected scores upon scores of new tenements for the labourer, and the result has been a marked improvement in the wellbeing of their inhabitants."

That last line or so might be taken for his epitaph. Whether it were in the crowding of St. Giles, or the pleasant paths around the Abbey—to wherever the Duke of Bedford's influence extended, there was a *marked improvement in the well-being of the inhabitants*. You witnessed it alike in the tenantry and the pea-

sauvery, and we had well-nigh added in the gentry of the neighbourhood. Let the reader only note how our reporter for Bedfordshire cited his Grace's conduct to the other Magistrates of his county. Let us but remember that, though good shot as he was, he gave up Game-preserving, and made the farmers his keepers; confident that they never would deny him the means for fair sport. And let us dwell for a moment on the welcome with which this example was cited in the discussion last year on that delicate subject, the over-preservation of game; and how the Bedfordshire men answered at once for the success of the experiment. It was this feeling of the true sportsman that went to complete the character of the Duke of Bedford as a country gentleman. He cared not for the butcheries of the battue, if he could get fair open shooting. He was a really good judge of a horse, and he bred some of the best; but he hated the mere trickery of the turf,

and for many years, though he ran horses, rarely himself attended on a course. He was an admirable horseman, and whenever the Oakley were in want of a Master he took to them, still subscribing liberally when he gave them up again.

We write on no hearsay evidence. We have seen the farming at and about Woburn. We have "told off" the cottages as we have driven along. We have heard the reception given to the Duke of Bedford's name at many a meeting in the Country, and we have learnt his character from all classes. It is one that we feel we could scarcely colour too highly, and it is one that we would specially offer for imitation to the other great landowners of the Kingdom. PROPERTY HAS ITS DUTIES AS WELL AS ITS RIGHTS—a principle of which no man has given a higher or a more earnest interpretation than the late lamented Duke of Bedford.

THE BREEDING OF IMPROVED STOCK.

CARMARTHENSHIRE FARMERS' CLUB.

The CHAIRMAN (Mr. Jas. Buckley, Penyfael) in introducing the subject for discussion said: I approach the question with considerable diffidence, because of its acknowledged difficulty, and the diversity of opinions entertained upon it. It is a subject, too, I should not have chosen to introduce, but from a conviction of its vast importance to the farmers who derive so large a proportion of their returns from the sale of the young stock they have bred and reared. I trust this discussion will elicit information, for there are those connected with this club, who have had considerable experience in the breeding of stock of various kinds. There are certain great natural principles with which (although they may appear somewhat remote) the intelligent breeder of stock should be familiar, and which I am induced to refer to the rather, as those principles have been the subject of attack by men—by men standing high for their attainments in natural science, and doubtless deservedly so, but who, if I may venture an opinion, have had but little experience in the breeding of our domestic animals. I refer to Mr. Darwin and his school. This great naturalist has lately published a work "On the Origin of Species," which has been extensively read. He attacks the fundamental principle always held by naturalists of the greatest eminence, that each species of animals was created separately or independently, and has a fixed existence. In opposition to this doctrine he argues that species are mutable and change, not into many varieties merely (which is allowed), but that these varieties in the course of time become new species, forming a fresh additional group of genus; and following the same course of argument, he goes on to show that the whole animal kingdom has descended from at most four or five original progenitors, if not from one prototype, into which life was at first breathed by the Creator; and that all animals have arrived at their

present state of perfection by a natural process of improvement—the human species among the rest. At a lecture delivered a few months ago by Mr. Huxley, a disciple of Mr. Darwin's, at the British Association, the Bishop of Oxford said—"If I may be allowed to inquire, would you rather have an ape for your grandfather or your grandmother?" The enthusiastic naturalist replied, "I would rather have had apes on both sides for my ancestors, than human beings so warped by prejudice that they were afraid to behold the truth." Mr. Darwin's book, however, abounds with interesting observations into nature, such as only a man of his great acquirements could make, and will be much read; but the deductions he draws are doubtless fallacious. When we find that he claims untold ages to bring about these changes, and calls such a period as from the date of the creation a fragment of time, it looks something like begging the question. But mere theory will not do for the farmer, his business is essentially practical; and it is quite sufficient for his purpose to know that the domestic animals with which he has to deal have at least continued specifically the same for the last 2000 years or more. It can be shown that there has been no specific change in them during that period. We therefore take it as a law of nature that species do not change, but are specifically permanent. Nature seems to have placed a guard that every species should continue unmixed and unchanged, for a cross-bred animal or hybrid, the offspring of a cross between two distinct species, is a barren mule, and incapable of producing offspring like itself, or any offspring at all, except in a few solitary instances when again paired with a pure species, and in those cases it has appeared a mere struggle into life. I met, however, an article, exceedingly interesting and well written, in the *Cornhill Magazine* of May last, in support of the above theory, and attempting to overthrow the

doctrine of the fixity of species by the announcement of a new animal having been produced between a hare and a rabbit, that proved perfectly fertile; that a number of them had been breeding freely among themselves for many generations, and that they constituted a new type of animals. This statement interested me so much that I was very desirous to get a sight of the new animal, believing it to be the first new type or species ever produced, and concluded that it would make its appearance at the Crystal Palace rabbit show; and indeed rabbits were shown there professing to be hare-rabbits, but no satisfactory account was given of them. Some rabbit-fanciers state that they had tried to get the cross, but had utterly failed; for when the hares and rabbits were put together they fought to such a degree that they would have killed one another had they not been separated. From what I have as yet learnt, I expect they were even worse cases than any that have sought relief under the new Divorce Act. Who can give credit to such a thing on a mere statement? for the structure, external and internal, as well as the habits of the two animals are widely different. The hare breeds only twice, or at most, three times in the year, and has only from two to four young at each litter; whereas the rabbit breeds six or eight times, and has four to eight at each litter. I think we may rest satisfied that we have nothing to expect from a cross between two different species, beside a barren hybrid. Now as to the crossing of varieties of the same species, have we not some improvement to expect from that source—that is, the crossing of one breed with another—I use the terms breeds and varieties as synonymous. This has become a subject of great interest. I think that experienced breeders, and naturalists who have paid considerable attention to this subject, are at length becoming of opinion that we have nothing to hope for after the first cross. Our most eminent agricultural writers, Youatt among the rest, were in the habit of attributing the origin of our improved breeds of cattle, and all our other improved domestic animals, to crosses with other breeds; but I believe experience of late years goes to show that there is a fixedness or permanency about varieties as well as about species; and that you cannot by crossing two varieties produce an intermediate variety, that shall be able again to produce offspring like itself. All our varieties will breed freely, and a first cross is usually a very robust strong-constituted animal; but then we must stop: the form cannot be continued. For instance, a cross between a Shorthorn bull and Ayrshire cow produces a handsome robust beast, showing externally the Shorthorn character—most excellent for the dairy, and afterwards for the butcher; in fact, a kind of intermediate animal, and so symmetrical and profitable that we would like to continue the race as a new breed; but we find that we cannot, for she will not produce offspring like herself, even though paired with a mate of a similar cross to herself. Breed with such for several generations until you have a large herd, and you will find that you have a mixed degenerate lot of mongrels, some of them crying back to the Shorthorn side, and some to the Ayrshire, and not

two alike among them. Try the same experiment with a cross between the Shorthorn and Hereford or Devon, and the result will be the same, but even more striking, as there is a wider difference between the breeds of the original parents. Thus there is a permanency in our varieties or breeds. They will mix in a first cross, but not blend, if I may so speak, for in the next generation they will begin to separate. If it were not so, the distinctive character of varieties would be soon lost—they would become extinct. As we do not find varieties in any species of our wild animals, it becomes clear that the varieties into which every species of our domestic animals have branched must be the result of the altered circumstances of food, climate, &c., to which domestication subjects them. But the change or variation is the work of nature, not the work of man, who does not know what variation takes place until he sees it; but when he does observe the variation, he is able to cultivate it, and bring it out to its fullest extent by judicious selection and pairing. For instance, the Blue Rock dove, from which all the varieties of our domestic pigeons are derived, never alters or varies in its wild state, but under the influences of domestication, it has run into many varieties. Take one of these (the fantail pigeon) as an example:—Man would observe in some individuals, a disposition to that fan-like development of the tail, which being elegant (for the forms exhibited by nature under improving circumstances are always beautiful) he would try to perpetuate, and by selection and pairing, he would cultivate it to its fullest extent. For two of these, in which this development was largest, being paired, their offspring would exhibit the desired peculiarity of tail still more fully, and by following the same course the greater excellence in that particular would be attained. So with the carrier pigeon as to its peculiarities, and the pouter as to its large development of crop. But if the amateur pigeon-fancier designed to produce a new variety between two of these, he could not do it. Thus we see that species, under the altered circumstances of domestication, will develop itself in various forms or varieties, which we may cultivate to great perfection, but we cannot alter them. We may mix them by cross-breeding, but they will not remain so, but go back again to the original form. This we may, in some measure, trace; look at the mixed (mongrel) fowls in our farm-yards, the dogs about our streets, or cattle in our fairs, and we may appoint each individual of them to the breed from which it originally sprung, and I believe that the whole of them might, by careful selection and pairing, be bred back again into their original varieties. There have been many speculations as to the origin of the Shorthorn variety of cattle, and also how their improvement was effected. Youatt, in his invaluable work on cattle, says, "No doubt can be entertained that they originated from a judicious crossing with other breeds;" but surely if such a system had been practised, we should have heard something of it. I am quite convinced that our native breeds, such as the Shorthorns, Herefords, Devons, and our own blacks, are pure varieties of nature's own forming, and that they have been improved by man in the several localities in which

they are now found. From the earliest periods, the counties of Durham and York had been famous for a breed of cattle similar to the shorthorns—doubtless the shorthorn breed. A spirit of improvement had manifested itself about a century ago among the breeders of this variety, occupying the rich grazing lands on the banks of the river Tees, which soon raised their cattle in quality and form above the common shorthorns. We are, however, mainly indebted to one man for the pedigreed race of highly improved shorthorns, so much esteemed at the present time. The breeder to whom I refer, was Mr. Charles Colling, and his great success was mainly owing to the surpassing excellence of one animal he chanced to get possession of; but, still, it was his great judgment that enabled him to avail himself of such a circumstance. This animal was the bull Hubback. From him, may I not say, all the high-bred shorthorns claim their descent; Hubback being the great-grand-sire of the bull Favourite. It was about the year 1777, that Charles Colling met with Hubback, and set about the work of improving the shorthorns with all the energy of an enthusiast. Such was his success, that at his sale, in the year 1810, his stock of 48 shorthorns realized £7115; his bull Comet fetching 1,000 guineas. It is well known that Mr. Colling experimented by trying crosses with several other breeds, and that they were failures. It is stated that a cross he tried with a Galloway heifer was successful—that having taken this one cross he bred back again to the shorthorn until all trace of the peculiarities of the Galloway were bred out; but that the deep round barrel, short fine legs, and soft curly hair of the Galloway were retained, though occasionally a dark muzzle, or a little dark hair approaching black, will break out in some individuals and betray the original cross. That there is a strain that sometimes produces individuals with these dark colours and called the alloy, there is no question; but as to the above being the cause, I think it would be easy to show the absurdity, if there were time. If any advantage is to be derived from a cross at all, no doubt the mode stated must be the way to effect it—the taking one cross and then going back to the pure breed. But how, I would ask, are some points to be retained, while others must be got rid of by breeding them out? How is it that our noted breeders of the present day, who have greater facilities than Colling, do not practise the same thing? It is a pity that Colling should have been so reserved, as he appears to have been, as to his plans and practice; but I believe there is every reason to conclude, he derived nothing but trouble and disappointment from his crossing experiments. It appears, I think, that Mr. Colling must have bred, what is termed, in-and-in, and that very closely at the commencement, and so, too, must the succeeding great breeders; otherwise, what is termed their blood would not be esteemed, and realize such prices as it does at the present day. I noticed a few weeks ago, in the *Mark Lane Express*, that Mr. Douglas's heifer, Queen of Athelstane, had been purchased for 500 guineas, by Lady Pigott, and his Almack Belle for 200, by the same lady. Many, I am persuaded,

have injured their stocks, from a notion that a continual change of blood was advantageous, and so have admitted what was inferior to their own. There are some strong opponents to breeding-in and-in, that is closely in the same families, and a lecture in the *Mark Lane Express* lately, even calls it incestuous; but surely this must be a mistake, for it does not follow that because the Great Ruler of all has prohibited marriage within certain degrees of relationship to a moral agent like man, and has attached to it probably the penalty of physical and mental debility, that it should be the same with the brute creation. We know, in fact, that it is not so, but that it is the natural economy of some species to pair in their own families. The dove tribe for instance, wild and domestic, invariably produce a nest of two young ones at a time, which are usually male and female, and which in due time pair again; and that so strictly, that twenty pair may be kept in an aviary, and there shall be no mixture, but each variety will continue true. This tends to make pigeon-fancying and keeping, easy. Again a covey of partridges continue together through the winter, until pairing time in spring. Are we to suppose that then the male birds of one covey, go to seek partners in another covey, and *vice versa*? Is it not much more likely that they pair among themselves? Those birds or animals that are gregarious, and assemble periodically in large flocks, may, and probably do, pair into other families than their own. It is argued that a want of stamina and constitutional barrenness is the result of close breeding for a lengthened period, and no doubt there is something in it; therefore those at the greatest distance as to relationship should be selected, but consistently with the particular points to be cultivated. The difficulty is—where the whole herd has to be improved by the introduction of one superior animal, as in Colling's case, and it is by no means an uncommon one. I would not, however, admit anything inferior to my own stock, either in appearance or pedigree, for the sake of change, and care should be taken not to attribute defects, &c., to the cause of too close breeding with which it may not be chargeable. Another important consideration to be taken into account by the breeder of improved stock is the respective influence of the sire and dam in the production of the particular points or qualities desired in their issue. It is only experience derived from long observation that can form the basis of anything like accurate judgment as to this particular; still there are some general rules that will be some guide. I may perhaps venture to say that the influence of the male parent will predominate in the production of colour, size, and form, and that of the female in constitution and temper, and perhaps in quality; but all this will be greatly qualified by other circumstances. About thirteen years ago, I kept a large dairy herd of about 30 cows, some of them superior Ayrshires, but the larger part were our native blacks. The bull I kept with them was a remarkably fine shorthorn, a pure-bred pedigree animal. The calves from both the blacks and Ayrshires took chiefly after their sire in colour, size, and form, as far as I could judge; the size was such that they fetched

an increased price from the butcher. I have had calves occasionally from Ayrshire cows, whose sire was our native black bull, and they were invariably black, or something approaching it, but I never kept any of them. When I changed my stock and began to keep Alderneys (about six years ago) I was not only desirous of having cattle of the best form and quality, but of getting them all self-coloured fawn, with black muzzles and hoofs, and a black tuft at the end of the tail, that being a Buckinghamshire fancy. I could get such there by paying an enormous price for them, which I was not disposed to do, but hoped to find some in Jersey. After however driving about the island for three days, I did not succeed in getting a single one, and so bought some spotted ones of superior form and quality. To go with these, I had an Alderney bull from Buckinghamshire, having the colour and points just mentioned, and which colour and points had been bred into his family for many generations. The result is, that I breed a large proportion of the calves like him. This year out of nine heifer calves, I have seven fawns with the black points, although nearly all their mothers are spotted. Such was the influence of the sire to colour, but I had form and quality too. The same kind of influence is found to extend to all our domestic animals. Our poultry—the chickens of a Cochín China hen and Dorking cock, have the Dorking colour and form; but some feathers on the leg, the want of the fifth toe, the strength of constitution, and buff coloured eggs, speak for the Cochín China mother. Now reverse the parentage. The chickens of the Dorking hen and Cochín China cock are so thoroughly Cochín China in plumage, colour and form, that they have been frequently (in the hey days of China) sold for them; but singularly enough they have always the fifth toe of the Dorking, which betrays their origin. The mule and hinney are a striking example that the external form goes after the sire, and the internal after the dam. The hinney is more like the horse; but the mule is the better animal, having the natural constitution of the mare its dam. The Arabs look chiefly to the mare for endurance, the English to the horse for figure and speed. Even in the vegetable kingdom the same principle reigns, and is well known to those nurserymen who bring out new varieties of fruits, flowers, and vegetables. For instance, the pollen taken from the early-frame pea to fructify a marrowfat blossom, will produce only a small pea like the male parent, and less hardy, following the marrowfat; but reverse the case, and take the pollen from the marrowfat to fructify the early frame, and a pea is obtained large in size from the influence of the male parent, and more hardy in nature from the mother, if I may so speak. But to breed first-class stock of any kind, there can be no doubt that equal care must be bestowed in selecting the most perfect and pure animals on both sides. Some of our noted short-horn men made a great mistake at first in this particular. They calculated that by procuring a bull of the best and purest blood, and cows of good points but without pedigree, they should attain their object of producing stock that would be up to the mark; but they were sadly disappointed,

and, after years of fruitless attempt, were obliged to sell off and begin again. Their stock was fair and fetched good ordinary prices, but far below what their after-stock realized, which was bred from pedigreed animals on both sides. I can refer you to the sales I speak of. I am satisfied that some of us make a great mistake in breeding horses, particularly by the use of mixed-bred entire horses. Whatever kinds of horses we are breeding, whether blood horses, dray horses, the Suffolk punch, or Welsh mountain ponies, I am well satisfied that they should be thorough-bred of their kind; and that on both sides, to secure the most satisfactory result. It would appear from what we witness, that some of our farmers think, that by hiring one of the great fat entire horses that we see paraded about our fairs in the spring of the year, and from a mare that they happen to have (no matter what kind) and that has been good once, but now worn out, that they will have a foal that will probably be something superior; but it ends in disappointment. Do we not frequently meet with in our fairs young horses for sale, that the owners profess have a good deal of pure blood in them, that have not a good point about them, and it would be difficult to say what they are adapted for, and the only indication of blood you can detect is perhaps a delicate skin, which is a positive disadvantage to such an ill-formed brute. As to the choice of males of any kind of stock, I would suggest that a medium-sized compact animal is preferable to a very large or outsized one. There is another principle I think worth referring to (but in which I have made no observation myself) on account of the high authorities who maintain it. The late Earl Spencer held it as a principle, that when a pure bred female had once had issue from one of a different breed, that she was herself ever afterwards to be considered a cross for breeding purposes. Mr. Goodwin, a gentleman for many years connected with the Royal Stud at Hampton Court, observed that many of the mares bred foals to the horse Actæon with white faces and white fetlocks, though Actæon himself had not a bit of white about him; but the year before these very mares had produced foals to the horse Colonel who had a white face and white fetlock. The circumstance of the chesnut mare having issue by a quagga (a species of wild ass) at the Zoological gardens has been often related; the mule offspring as might be expected bore a strong resemblance to its sire, but strange to say her subsequent foals, though from a pure bred horse, bore characteristics of the quagga. These and other similar cases should at least serve as a caution not to take crosses from females from which choice stock is intended to be bred. Now, a few words as to the improvement of our native black breed of cattle, for there is no time, even if it were desirable, to go into the question as to whether a better or more profitable breed might not be introduced to supersede them; but perhaps, in passing, I may venture an opinion, which of course you will only take for what it is worth, that our native breed is susceptible of great improvement. I have occasionally seen some beautiful specimens of the breed; and once some noble ones which were exhibited by the Hon. Col. Pennant, of Penryn Castle,

at the Smithfield Club Show. They are in existence, and where there are a few, there may soon be many, and even superior to any that may now be found, for they will still improve under more extensive cultivation, and, being naturally adapted to the soil and climate of this locality, will under improving circumstances be probably more profitable than any other breed. It was judiciously remarked by Mr. Davies at the dinner of the late Llandilo Show, that they wanted more loin and to handle better. These are doubtless their worst points: they are too narrow and flat sided, and usually hard handlers, but what may not be effected by judicious and persevering selection, careful breeding, and improved management? We should soon see brought about a better form and quality: selecting those beasts with most fully arched ribs would give a rounder barrel, greater breadth, and more loin. The best of our native breed are not much wanting in depth of carcass, or levelness of back, but they do want finer bone, and a smaller, neater head; but those points would gradually improve, as would also the quality indicated by a better touch or more mellow handling. But how is an ordinary farmer to set about improving his native stock? Why, if he is very restricted in his means, and it is as much as he can do to scrape together his rent by the day he has to pay it, he cannot effect much improvement in his stock or anything else; but if he has capital suited to his farm, I would say let him acquaint himself thoroughly with the kind of animals he wants to improve the points that constitute their excellence, and which he has to cultivate. Let him keep his eyes open, and be on the look out, as Colling was, and when he lights upon anything very superior, especially if it has points or quality in which his stock is defective, let him secure it, although it may cost him something more than its apparent value. He will find it, I have no doubt, even more difficult to get quality than form, quality indicated by that yielding mellow touch, and soft curly hair, that tells you when you put your hand upon the animal that it will thrive and speedily convert all the food you give it into flesh and fat. Perseverance will accomplish it, recollecting that "like begets like," but still qualified by the principles I have endeavoured to elucidate. Following this course he will find in a few years that he will not easily meet with stock to beat his own, for it will have attained such a state of improvement as he could hardly have anticipated at the outset. This at any rate appears to me the course to be pursued; but there are gentlemen connected with this club of greater experience than myself, and who will I trust give us the benefit of it before this discussion is brought to a close. It frequently happens that in improving a stock the breeder is confined to one or two animals of high qualities, possessing the desired points in a high degree, and will be compelled, or at least desirous of eventually producing his whole stock from them, and he will have no alternative but to breed very closely for a time. This is my own case. I met with a heifer in the island of Jersey that is in several respects superior to any other Alderney I have seen, having in fact a combination of the characteristic excellences of her breed; and I hope

in a few years to be able to trace all my herd up to her. I believe that I shall suffer no disadvantage by rather close breeding at first, but be able to entail her valuable qualities to the whole herd; and the circumstance of the whole herd having been derived from one animal will be likely to give such a uniformity of character to the appearance of the whole as greatly to add to its beauty. An interesting paper on the "Maise more Shorthorns," published in the last *Welshman*, certainly gives one encouragement to pursue such a course. It states "that every cow and heifer," on that extensive farm, "with one single exception, is bred from two cows which Mr. Morris's father bought from Mr. Strickland, of Apperley Court, in 1829." Mr. Strickland's herd was then of long standing, and consisted of the best blood, he having been a purchaser at the sales of the two brothers Collings, and had always used first-rate bulls." It goes on to state, "like Mr. Stratton's, Mr. Morris's Shorthorns are highly prolific, and he seems to have none of the apprehensions of abortion some of our breeders are compelled by sad experience to entertain." Is not this evil, as well as barrenness, more the result of too high feeding than any other cause. We sometimes hear it intimated that a good deal of breed goes in at the mouth—that is, that it is attributable to good feeding. I cannot subscribe to this doctrine at all; but I am quite ready to admit and enforce, that no attention to breeding, be it what it may, can succeed, unless it is accompanied by proper feeding and management from the beginning. They must go hand in hand. This however is not our subject to-day, but it is a subject that I hope will be brought on for discussion at some early period. I believe it is in the power of every farmer to improve his stock, and that greatly; but it must be an object of special attention, and if made so, it will not only be a source of greatly augmented profit, but of pleasure and satisfaction; for what can be more pleasing to a farmer than to see his stock improving in quality every succeeding year, particularly with the knowledge that his animals will always command a ready market, and realize a good price, even frequently beyond their value? for there is always a desire to procure what is superior. Would not this be a much more pleasant state of things than what we frequently witness at our fairs? that is, the farmer standing all day long behind some miserably inferior stock, until you do not know which looks most wretched, the poor animals or the farmer himself, who at length is obliged to drive them back home again, because no one will buy them at hardly any price; whereas if his stock had been what it would have been by following the course I am endeavouring to point out, he would have met with an eager purchaser at an early hour in the morning, and soon returned home to cheer his wife with the account of the excellent sale he had made; leaving only some lingering regrets behind at parting with animals to which they had become attached from the care they had bestowed on them.

Mr DAVIES, Noyaddfach, said that the greatest care should be taken in the selection of stock for breeding, and it would be found in practice that out of a small herd not more than two or three

would answer the purpose. When a few cows were selected on account of the superior stock they produced, their calves alone should be reared, and then with a good bull and care in management there was no fear of the result. In a herd produced in this manner, the cattle would singularly resemble one another, so that it was hardly possible to recognise one steer from another, or to decide which was the best. He believed cattle were susceptible of unlimited improvement. Their aim should be to secure the form which presented the choicest pieces of meat in the greatest quantity, and to fix upon those animals which would put flesh on those points most readily.

Mr. J. L. PHILLIPS said that for the most part he concurred in the principles which Mr. Buckley had set forth, but there were one or two points which he did not agree with. The first was the advantage of breeding in-and-in. He could not see there was any advantage or necessity for doing so in the present day. It was true good animals were sometimes produced in that way, but the practice was bad and opposed to the universal law of nature. Besides, they could obtain a sufficient variety of animals of any breed to avoid in-and-in breeding. The laws of consanguinity must be observed, and if they were not, many ill consequences would follow. History revealed to them the penalties attached to an infringement of these laws on the decay of the regal families of Europe. These families were no doubt at one time famed for physical and mental excellences, but now they are a degenerate race, characterised by bodily and intellectual weakness. And so it was amongst animals. He knew a man farming 150 acres, who had a boar which produced monstrosities from breeding in-and-in. The young litters were all legs and ears. The same man kept a ram for breeding in-and-in, and the sheep produced were miserable creatures. Some years ago he himself had a boar which he so used, and the litter she brought was large, but they could not walk, and every one of them died. He did not at that time understand why the young pigs were so puny and weak. So he bred again, determined if possible to solve the problem. The next litter consisted of only two miserable creatures, which soon died. He tried once more, with the same result—the litter moving about for a short time with their snouts to the ground, and then died. Here were facts condemnatory of in-and-in breeding. He tried a similar experiment with sheep, and the lambs in not a single instance survived the winter. Why not, then, adopt the correct principle in breeding stock—selecting the best animals in form, strength, bulk, and blood. Much depends, indeed all depends upon the exercise of a sound judgment. But it was of no use to have a good breed of animals unless they had plenty of suitable fodder. Many farmers neglected the proper feeding of their stock, and what could they then expect? Good animals and nutritious fodder must go together. In fixing upon an animal they should select that sort which had those points to perfection which are most esteemed for the table—small head, short legs, and small bone, points which should not be disregarded. Then it was necessary to see that the

animal attained an early maturity, had a fine skin and a mellow touch, indicative of a tendency to put on flesh. As to horses, the main points are muscular activity and a vigorous constitution.

Mr. MARR said his knowledge and experience confirmed the principles which Mr. Buckley advocated. He paid considerable attention to the breeding of stock, and being a native of Aberdeenshire and all his life a farmer, he ought to know something of the subject. He advised the farmers of this county to spend an occasional holiday in Aberdeenshire, for there they would see in practice what the lecturer inculcated. He believed a really good breed cannot be produced by crossing, the cattle would sooner or later revert to the original style. Many farmers with every advantage in their favour had tried to do so, but they had signally failed. A first-rate herd of cattle could only be obtained from a few well-selected animals. Mr. Phillips's objection to breeding in-and-in did not apply to cattle, and the parallel he had drawn between animals and man was fallacious; nor did it apply to Mr. Buckley's theory, for he specially reserved the human race. Still the in-and-in system was not at all times to be practised, but it was sometimes indispensable. He thought there were very few pure shorthorns in this county—not half-a-dozen so far as he knew, and that being the case how were the farmers to get a pure herd?

Mr. W. E. GWYN did not approve of crossing, nor was it necessary to cross, as the pure animal was susceptible of the highest improvement. The way to cultivate a good and profitable herd of cattle was, in the first place, to select some well-looking cows without reference to breed, and put them to a pure-bred bull. Now by keeping such a bull and by proper selection, any farmer might in say ten or twelve years obtain a really fine and paying herd. The farmers in this county could not in any other way improve their stock; they had neither capital nor disposition to invest in the purchase of an entire herd of pure stock, but in the way he had described it could be done with profit, which was, after all, the main thing. With respect to in-and-in breeding he fully concurred with Mr. Buckley, and wholly dissented from Mr. Phillips. His practice was when he got a good animal to use him. The boar Mr. Phillips had referred to ought not to have been so used—that was objectionable. A sire might be put to his progeny with advantage. He knew instances of some of the finest breeds in the country being bred in-and-in for eight or ten generations. He had a case in his mind—a bull being used by his progeny for four generations, and indeed the very best animals were bred in that way. The ordinary rule was, put a sire to his progeny, but never otherwise. That was the practice adopted by the most famous breeders. Mr. Bakewell, whose flock of sheep was unrivalled, bred in-and-in, having introduced no fresh blood for more than forty years, and yet he took all the prizes, and what was more, those who bred from his stock were equally successful. However, in breeding in-and-in, great care and judgment were indispensable. Well, then, with regard to the black cattle he would observe that this breed was capable of immense improvement. They never

had the care and attention bestowed upon them which had brought the shorthorns and Herefords to perfection. Still he was doubtful that it would pay at present. It was worth an experiment, but the experiment should be fairly carried out. It would not do to try for a year or two, but proper time should be given to arrive at perfection. He gave them a short trial, and finding them so slow at putting on flesh, he got tired of them, and had now turned his attention to the shorthorns. He commenced by using a pure bred bull—not a very handsome fellow, but well bred, from Mr. Stratton's herd. Mr. Stratton sold his sister for £700. He intended to use this bull for two or three generations, and then when he grew old he should supply his place with another pure-bred from the same herd.

Mr. Marsh, Mr. Harris, and other farmers continued the discussion, and Mr. Buckley having replied, it was resolved—"That the acknowledged inferiority of the cattle and stock of this county generally being attributable to the carelessness and want of judgment displayed in breeding, and after-mismanagement, this meeting recommends, as the first step to its improvement, the carrying out of those principles of breeding set forth in Mr. Buckley's address."

SMITHFIELD CLUB.

The first half-yearly General Meeting of the members of this Club was held on Wednesday, May 22, at Freemasons' Hall. The chair was taken at a quarter past two by the President, Lord Berners. There was but a small attendance of members, and amongst these, Messrs. C. Stokes, W. Torr, Jonas Webb, W. Rigden, J. Turner, J. B. Simonds, Giblett, H. Corbet, More (Wilts), S. Sidney, H. Strafford, W. H. Davis, J. Druce, S. Druce, J. Woodward, &c., &c.

The minutes of the last meeting having been approved,

Mr. B. GIBBS, hon. secretary, read the following report of the stewards respecting the Devon steer, No. 7, exhibited in Class I., at the last show: "Mr. Wortley produced his memorandum book showing the dates of the bulling and calving of the cow said to be the dam of the steer No. 7, also his man's memorandum book, showing the bulling of the cow, and a certificate of the castration of the steer in question. The stewards, considering that in the first instance it was only a doubtful case, are of opinion that the prize should now be paid to Mr. Wortley. At the same time they must express their regret that Mr. Wortley has not kept a herd-book in a systematic form.—HENRY SMITH, CHARLES STOKES." Mr. Gibbs also read the subjoined report: "The stewards have considered the case of the pen of pigs, No. 306, which were disqualified in accordance with the following rule, under which they were entered: '21. All the pigs exhibited at the Smithfield Club Shows shall have the state of their dentition examined by a competent authority previously to the judges making their award; and if the dentition shall satisfactorily indicate that the age of any of the pigs has been incorrectly returned in the certificate, the stewards shall disqualify such pig, and report their having done so to the first meeting of the members of the Club, and such disqualification shall be final and without appeal.' The stewards consider that the case was referred to them by the last General Meeting (in the absence of Professor Simonds) in order that they might ascertain whether any doubt existed as to the actual state of the dentition of the animals. As it appears that Professor Simonds does not entertain any doubt upon this point, the stewards consider that according to the wording of the above rule the disqualification was unavoidable. The stewards, however, think that the rule enforcing final disqualification from the state of dentition

might be advantageously altered or modified, of which notice has been given at the General Meeting in December.—HENRY SMITH, CHARLES STOKES."

These reports were adopted by the meeting.

Several new members were proposed and elected.

Mr. TORR proposed that Lord Feversham should be the President for next year. He said he believed he was expressing what would prove to be the unanimous feeling of the Club when he said that a better selection could not have been made (Hear, hear). His lordship had ever taken a deep interest in their proceedings, and was alike by his high rank and station and by his devotion to agricultural pursuits, and especially to the breeding of stock, eminently fitted for the office (cheers). He added that the effect of the adoption of his proposal would be that Lord Feversham would accede to office on the rising of the annual meeting in December next.

Mr. STOKES seconded the motion.

The CHAIRMAN said he did not think the Club could possibly select a more fit person than his old friend and schoolfellow, Lord Feversham, to be the President of the Club for the ensuing year.

A conversation followed with regard to the precise period when the President-elect will come into office, from which it appeared that the chair at the next annual dinner will be taken by Lord Berners, and that Lord Feversham's presidency will extend over the year 1862.

The motion was put and carried.

Mr. TORR introduced the question of the propriety of a limited number of printed catalogues being in future provided for the use of the members admitted to the private view of the annual Show.

It was left to the Hon. Secretary to make the necessary arrangements for that purpose with Mr. Bulnois; Mr. Gibbs having, as Mr. Torr stated, intimated to him that he thought the object might be accomplished with Mr. Bulnois' consent.

On the motion of Mr. JONAS WEBB, seconded by Mr. WOODWARD, a vote of thanks was accorded to the Chairman; and his Lordship having briefly acknowledged it, the meeting separated.

HADLEIGH AGRICULTURAL SOCIETY.—The annual exhibition of this Association, one of the most useful and practical of its kind in the kingdom, was held on Friday, May 24. The show of horned cattle was small; but a fine bull, entered by Mr. W. Grimwade, attracted a good deal of attention. The exhibition of Suffolk horses worthily sustained the high reputation of the county in that "speciality," the names of Badham, Stearn, Gurdon, and others being sufficient to ensure the excellence of their entries. Mr. Walter Strutt's stallion for general agricultural purposes, and Mr. Badham's brood mare of the same class, excited much notice; and some clever colts and fillies were shown by Mr. Gurdon, the executors of the late Mr. Isaac Everett, and others. Several of the sheep classes did not fill, and the pig classes were not of remarkable merit. The sum distributed in prizes in the horse class was £12 10s., Mr. Walter Strutt, Mr. G. D. Badham, Mr. W. Gurdon, Mr. S. Whight, Mr. J. Vince, the executors of the late Mr. Isaac Everett, Mr. W. Wilson, Messrs. Stearn, and Mr. T. Partridge being the winners; £5 10s. was awarded to exhibitors of cattle, being taken by Mr. W. Grimwade, Mr. J. Gentry, and Messrs. R. and J. Rand; Mr. J. Partridge, Mr. T. Kersey, Mr. W. Strutt, Mr. R. Sheldrake, Messrs. R. and J. Rand, and the executors of the late Mr. Everett, divided £10 10s. in the sheep classes; and Mr. Vince, Mr. Sheldrake, and Sir Charles Rowley were awarded £3 for pigs. The labouring classes were not forgotten—prizes to the extent of £28 15s. being allotted in prizes for meritorious service and social worth. The day was wound up with a dinner, and plenty of speechifying, much of it of a practical turn. To this feature in the proceedings we shall recur at more length hereafter. The Lavenham Farmers' Club, another Suffolk organization, has also just held a meeting; but there was little of a distinctive character about the gathering.

CALENDAR OF AGRICULTURE.

The greater part of the turnip crops are sown in this month. The land must be thoroughly pulverized by previous workings, all weeds and stones removed, and the surface rolled flat. Open the drills with a bout of the common plough, or by one furrow of the double mould-board plough; lay the dung in the hollows from one-horse carts, spread it evenly, and cover it by the plough without delay, and sow the turnip seed immediately on the fresh tilth, with a two-ridge machine, provided with coulter and a roller. In the case of cloddy and crumbling soils, roll with a heavier weight, which crushes the clods, closes the surface against drought, and acts as a lock and key with regard to moisture. In dry seasons this rolling is a valuable part of turnip farming.

Sow swedes till the middle of the month, and then go on with green rounds, and ultimately sow the white globes. Sow with the drop drill all artificial manures, as bones, guano, and ashes, bran and rape dust, and roll immediately. Turnip sowing should be nearly finished this month.

Plough pared and burned lands, on which the ashes are spread, with a thin furrow, harrow the surface into a fine tilth by repeated harrowings; sow the seed by hand, and cover it by a single or double tine of the grass-seed harrows. In some cases a rolling may be necessary. If the soil is loamy and soft, work and drill it as usual in tilth.

Plough the intervals of the drills. Horse and handhoe potatoes, beet, parsnips, and carrots. Plough potatoes deeply, especially on stiff soils,

and break the drills finely with the hand hoe. Minute pulverization adds much to the success of crops.

Shear sheep, and mark by distinctive signs the different ages and conditions. Examine the animals closely in the mouth, shape of form, and quality of the wool: the inspection will much assist the sorting for the tugging season.

Wean the lambs of the year, and place them on the best pastures, and beyond hearing the bleat of the dams. Put mares to the stallion every fortnight.

Cut and destroy all weeds on pastures, pull by hand all tall weeds among grain crops, and destroy all weeds on road sides, or ditch and hedge banks. The winged seeds are carried by the wind to a great distance, and propagate very readily.

Hay harvest will commence during this month in early seasons. Clovers, sainfoins, and early meadows are cut by scythe, the grass tedded behind the mowers, put into cocks, again spread abroad, and re-cocked, and then carried to the rick. Employ plenty of hands, at least six to a mower. In stacking hay, allow the rick to consolidate by its own weight, rather than tread it into firmness, as is usually done. For this purpose, carry a quantity of dried grass daily, if the weather permits, and lay it together lightly. A tarpaulin cloth protects the rick from heavy rains, and a light sailcloth screens it from occasional showers. Allow the rick to be well consolidated before pulling the sides into form. Then one process finishes the operations.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

First week:—Sow early sorts of peas, as Hotspur, Charltons, and Cormack's Kent, with a few rows of the tall marrow. Peas sown late rarely escape mildew. Sow kidney beans and runners for succession; cabbages to come in speedily; Dutch turnips for autumn; carrots and onions to be drawn young, or to stand the winter.

Transplant cape broccoli about the middle of the month, cauliflower for August, making the ground rich with compost, also transplant borecole, Jerusalem and Scotch kails, savoys, and Brussel sprouts.

Asparagus beds still yield, but should not be cut beyond the 10th. Beds and rows are mutilated by too close cutting. A shoot should always remain untouched to each crown. Scatter rich earth, with droppings, over the beds; but avoid salt, as it decomposes the tissue of wet leaves, and kills the plants: it is better mixed in an ounce or two, with a bushel of compost, and thus be washed into the ground.

Plant young lemon-thyme, savory, sweet marjoram, basil, and also slips of lavender, rosemary, rue, and other handy sweet herbs, in cool shady beds, for subsequent transplantation.

Cut the aromatic herbs for drying, when they

begin to flower. Thin out onions by degrees for use, leaving the bulbing stock from four to six inches asunder.

If the weather be very dry, frequent light hoeings, to keep the surface from cracking, will attract much moisture, and bring on the plants. Severe droughts have often shown this to be the case with onions.

Fourth week:—Sow again turnips and salads, and lettuce.

FRUIT GARDEN.

Strawberry rows should be stringed on each side, the twine fastened to short sticks, so as to support the entire rank of trusses. Shorten the shoots of apple and pear trees, dwarfs, and espaliers: the ill-placed shoots ought to be removed to the bottom.

FLOWER GARDEN.

Arrange the green-house plants, now brought out, in neat order, facing the north. Plunge azalies into peat earth. Place flowering shrubs, and also herbaceous plants, the low ones in front, and the high ones at the back, rising in gradation. Display the colours in order, when the collection of plants is miscellaneous.

Take up bulbs when the green parts change colour and become dry.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MAY.

Owing to the prevalence of cold north-easterly winds vegetation generally made very slow progress during the first three weeks of the month, and apprehensions were entertained that the harvest would not only be late, but unproductive. The temperature having risen considerably since the period here indicated, the appearance of the country has undergone a most beneficial change. In all quarters the crops have grown somewhat rapidly, and the young wheat plants have assumed indications of comparative health and strength. We may observe, however, that on many of the light soils they are very thin, indeed unusually so in some districts, and as far as we can judge at present, that they do not promise a large return. Barley and oats appear to have suffered considerably from unseasonable weather; nevertheless, our advices are not of a character to warrant us in saying that there will be any great deficiency in the yield. Both beans and peas, though very backward, are looking well.

The stocks of wheat in the hands of our farmers are now reduced to a narrow compass. Notwithstanding that the general quality of the samples has improved, and that high quotations continue to be realized for all good and fine samples, the supplies on offer in the various markets of consumption have not increased; yet the trade, arising from large importations from the Continent and America, has ruled very inactive, and in some instances prices have had a drooping tendency. The advance in the value of money at the Bank of England to 6 per cent. has, no doubt, had considerable influence upon the extent of speculative operations in foreign qualities, to force sales of which 2s. per qr. less money must have been accepted by the holders. As regards the future range in the price of wheat, various opinions are entertained. Some persons have intimated that good wheats must be comparatively dear for several months. Their value, however, will be chiefly determined by the quality and productiveness of this year's crop, and to some extent by the price of money in the discount market. One thing is evident, viz., that we shall continue to receive an enormous import of foreign produce, since we find that great abundance still exists in the Northern States of America, and that the supplies in the European markets are fully adequate to even an increased export demand. At present, there is no room for an improvement in the quotations, in consequence of an accumulation of stock in our warehouses; but we do think that there is room for a decline in the value of most kinds of wheat.

There has been only a moderate inquiry for all descriptions of spring corn. The return of warm weather has checked the sale for malting barley, and the abundance of grass in the pastures has produced some heaviness in the oat trade. The stocks of English are unusually small, even for the time of year.

Fat stock has fared remarkably well. The somewhat rapid growth of grass has produced a good supply of food, and it is gratifying to find that the rot in sheep has become much less apparent than at any period during the whole of the present year.

The public sales of colonial wool—at which about 60,000 bales will be brought forward—have progressed steadily. All good and fine qualities have moved off steadily, at full quotations; but low parcels have ruled in favour of buyers. The transactions for shipment to France and Belgium have amounted to about 8,000 bales. English wools have commanded rather more attention, but no quotable change has taken place in their value. The supplies in the hands of our manufacturers continue limited.

The best hay and straw have been in good request, at full prices; but inferior kinds have commanded less attention. Most of the markets have been seasonably well supplied. Meadow hay realized £2 to £5 5s., clover-hay £3 10s. to £6, 6s. and straw £1 15s. to £2 2s. per load. There is still a large quantity of inferior meadow hay in stack in various parts of the country. The duty on the present year's growth of hops

has been done at £150,000 and £130,000, and the accounts in reference to the appearance of the bine are somewhat unfavourable. The continuous importation of foreign hops has greatly interfered with the demand for home-grown qualities, but without leading to any further decline in the quotations. On the contrary, yearling hops have produced rather more money.

For the time of year, large supplies of potatoes, in fair saleable condition, have been on sale in the metropolitan markets. Good and prime samples have sold at from 120s. to 150s. per ton, but other kinds have moved off slowly at from 60s. to 110s. per ton. New potatoes have been in request, at from 10s. to 20s. per cwt. The growth of potatoes promises to be a large one. Everywhere the haulm is remarkably healthy, and the tubers are, for the most part, sound. Accounts from Guernsey and Jersey state that the potato crop is looking well.

Fine wheat, barley, and oats have continued in steady request in most of the Scotch markets, at about stationary prices, but other kinds have commanded less attention. Some correspondents state that the supplies on hand are still in excess of last year, notwithstanding the somewhat heavy shipments to the south. Other kinds of produce have sold slowly, but at full quotations. The crops generally are looking well, though somewhat backward.

In Ireland, the grain trade has been very inactive; nevertheless, no change of importance has taken place in prices. The supplies of produce on offer have not increased to any extent, although the importations from abroad have been liberal. Potatoes are, for the most part, looking well.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that the Metropolitan Market has not been to say largely supplied with beasts, the demand, since we last wrote, has been somewhat inactive, and in some instances the quotations have had a drooping tendency. The general quality of the stock received from Norfolk and Scotland has proved remarkably good; indeed, we have seldom witnessed a finer collection, both as regards weight and condition. The crosses have appeared in prime order, and most of them have commanded the highest quotations. This speaks well for the new system, which, we doubt not, will continue profitable so long as it is not carried too far. In the early part of the month, nearly all breeds of sheep showed signs of foot rot; but, since then, a decided improvement has taken place in them, and the disease appears to be rapidly subsiding. Downs and half-bred sheep have sold readily, at improved quotations; but other breeds have met a slow inquiry, at about previous rates. Lambs, calves, and pigs, have continued in fair request, at full currencies. Very favourable accounts have come to hand from nearly all parts of the country in reference to the appearance of the pastures. There is now every appearance of a full average crop of hay, and, consequently, an abundance of grass for both beast and sheep. This abundance will, we trust, do much for Lincolnshire, &c., in the production of stock for London for the next six months.

The imports of foreign stock have been on a fair average scale, or as follows:

					HEAD.
Beasts ..	..	..	..	..	2,118
Sheep ..	..	..	..	..	14,316
Lambs ..	..	..	..	..	665
Calves ..	..	..	..	..	959
Pigs ..	..	..	..	..	820
Total ..					18,978
Same time in 1860 ..					18,900
1859 ..					10,718
1858 ..					6,703
1857 ..					7,243
1856 ..					3,556
1855 ..					7,103
1854 ..					4,703
1853 ..					13,007
1852 ..					8,506

The sheep from Germany, though they carry rather more internal fat, still arrive in miserably poor condition.

The total supplies of home and foreign stock disposed of in the metropolitan market have been :

				HEAD.
Beasts..	..	..	..	19,500
Cows ..	..	..	..	500
Sheep and lambs ..	..	..	..	113,730
Calves..	..	..	..	1,178
Pigs ..	..	..	..	2,950

COMPARISON OF SUPPLIES.

May.	Beasts.	Cows.	Sheep and Lambs.	Calves.	Pigs.
1860.....	19,040	543	124,580	2,059	2,950
1859.....	17,980	482	113,512	1,012	2,260
1858.....	18,722	480	115,886	1,671	2,760
1857.....	18,995	450	104,990	1,415	2,530
1856.....	18,741	495	119,640	1,260	2,545
1855.....	19,847	410	113,600	2,470	2,590
1854.....	20,831	576	124,824	2,146	2,435

The arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire have amounted to 11,200 Scots, &c.; from other parts of England, 1,500 various breeds; and from Scotland, 2,887 Scots and crosses. In the corresponding period in 1860—during which, it will be recollected, great excitement prevailed in the trade generally—only 94 beasts reached us from the whole of Scotland. The present large arrivals from that quarter have, of course, tended to keep down prices.

Beef has sold at from 3s. 4d. to 5s.; mutton out of the wool 3s. 6d. to 5s. 6d., lamb 5s. 8d. to 7s. 4d., veal 4s. 4d. to 5s. 4d., and pork 4s. to 5s. per 8lbs., to sink the offal.

COMPARISON OF PRICES.

	May, 1857.			May, 1858.		
	s. d.	s. d.		s. d.	s. d.	
Beef from	3	0 to 5	0	3	0 to 4	6
Mutton	3	4 to 5	4	3	2 to 4	6
Lamb	5	6 to 7	0	5	8 to 7	0
Veal.....	3	8 to 6	0	4	0 to 5	4
Pork.....	3	8 to 5	0	3	2 to 4	4

	May, 1859.			May, 1860.		
	s. d.	s. d.		s. d.	s. d.	
Beef from	3	4 to 4	10	3	6 to 5	6
Mutton	3	6 to 5	0	4	0 to 6	6
Lamb	5	4 to 6	4	5	8 to 8	0
Veal.....	4	0 to 5	6	4	4 to 6	6
Pork.....	3	2 to 4	2	4	0 to 5	4

Newgate and Leadenhall markets have been well supplied with all kinds of meat, and the trade, generally, has ruled inactive, at drooping currencies. The top price for beef is now 4s. 4d.; mutton, 4s. 8d.; lamb, 6s. 4d.; veal, 4s. 8d.; and pork, 5s. per 8 lbs. by the carcase.

SOUTH LINCOLNSHIRE.

We have, to all appearance, seen the last of the long unpropitious weather. The past week has been very favourable for all the growing crops and grass pasture lands, which are rapidly assuming their best state of greenness. A beautiful rain fell about a week since, and this, together with a much warmer temperature, has caused this most acceptable change. The bursting into foliage of the trees and hedges, the progress of the late wheat crops, the starting into growth of late-sown and long earth-fastened spring crops, the softening of the hard clods permitting their speedy preparation and the deposit of the mangold crop, and last, though not least, the real setting-forth of growth of the long-detained potato plant, have all tended to make the present a pleasant and encouraging season, and cause joy and gladness in the land. Long may it continue, and may gratitude and thanksgiving be fervently rendered to Him who does all things right! Up to the middle of the month farmers here were in great tribulation—keeping scarce, lands all set fast, weather cold and dry, crops decreasing in plant every day, stock pining; now we are all once more free, and everyone is fully engaged making up for lost time and a backward season. In the fens much wheat has been ploughed up, and the land sown with spring corn; but as the wheat was taken off chiefly by wire-worm, the spring crops are faring no better; they

look sadly, and much will be lost. The whole of the spring crops have come up unsatisfactorily, and none are looking truly well. The wheats are still thin and patchy, though growing fast; those fed off and subsequently well hoed are thickening considerably: the writer of this report has 44 acres which were thus treated in the middle of April; it is tillering exceedingly well, and although very thin before feeding off, it now, for the most part, is becoming a full crop. Oats are very various; some parts of the fields are only just through, while other parts are quite flourishing. Barley is better, more pains having been taken to secure a good seed-bed. Beans are a poor crop, many fields ploughed up, and resown with other grain. Peas are good where very early sown, but late-sown crops are miserable failures. The cold weather and slow growth enabling the slug to take every advantage, all kinds of schemes are resorted to to make up a plant. Oats are hoed in, &c., &c. The cattle on good grazing pastures are doing well, but such are scarce. The majority of the pastures are backward, and the present week has only just brought them round or forward enough for a full bite. The sheep pastures are rather better; they are short, but fuller of grass, and the sheep as a whole do well. "The cake-men" are having the best of it this season. Nothing excels genuine cake on second-rate grass land; it greatly advances and improves both stock and land. It is lamentable and shameful to find that some of the stuff we use is positively of no value to them. By all means deal with and keep close to a true and trustworthy man; stigmatise and abominate adulterations as much as possible, and expose the crushing. We must regret the dullness in the corn-markets, otherwise our produce is selling satisfactorily. Beef, mutton, pork, wool, all sell well. Our spring markets have been truly brisk both for fat and lean stock, but the quantity shown has been unusually short. Of fresh cattle for early fattening the supply was never less, of sheep certainly more abundant, but not great. Wool seems to bear a good place in our grazing department, and the demand for it does not give way to any extent; there is generally some little hesitation amongst buyers as the new clip is coming into the market, but no actual depression has taken place. Trade is good, so we shall counsel patience and firmness in the seller. We have no idea the American struggle can last long; only let the Southerners feel the firmness and energy of the North, and the people, if not the politicians, will soon demand a cessation of such unbrotherly quarrels: what with slaves to watch and the North to fight, they will soon tire.

SUFFOLK.

After the piercing cold winds from the east and north-east, which have been so productive of colds and discomforts to the human, of white frosts and stagnation to the vegetable, and of scarcity of food to the animal world, the present change to the cheerful influences of the rays of an unclouded sun, of mild genial breezes, and refreshing rains is most acceptable. Till within the past few days we have had no spring weather, and vegetation has struggled at heavy odds against opposing forces into development. Both Nature and men have literally looked blue under the north-east visitation, and whilst agriculturists have complained generally of their prospects, and specially of the scarcity of food, those engaged in trade have regretted the absence of customers, and the whole tone of society has been a chronic complaint at the absence of prosperity. Undoubtedly the community at large are feeling the effects of a deficient harvest, and of the monetary drain upon the resources of the kingdom, to purchase that as food from the continent which we usually produce from our own fields. Suffolk, as specially a corn-producing county, much suffers; nor does she escape loss as a root and meat-producing district. Her return is certainly £1,000,000 below her average annual production; and when it is considered that not only is this one million not resulting but that another million has to be found in other resources—in banking firms, friends, or somewhere if possible to supply its place, and allow of culture for the future crop of the present year? it need be no matter of surprise that the whole community of Suffolk suffers—farmers, of course, especially, but trade also, as a natural consequence. Economy in expenditure is a dire necessity, and if the earth fails in its fruits, Suffolk, as a purely agricultural county, loses the only

source of her wealth, and the fountain of outlay is dried up. The imports of grain and flour show the position of the kingdom. We have at hand the estimated value of such imports for the two first months of this year as compared with January and February of 1859 and 1860, viz.,

1859	..	..	£1,941,880
1860	..	..	1,709,471
1861	..	..	6,176,652

Such facts need no comment. It is no small matter for wealthy England, and Suffolk as a portion of that kingdom, to suffer the partial loss of a corn, root, and hay harvest, and pay millions for the substitute. Never has the opinion been more prevalent than at the present time, with the cotton supply in doubt, and the general depression prevailing from a scanty harvest, that though manufactures and trade are most desirable, we cannot afford to despise British agriculture. Its prosperity and its development, even far beyond its present position, is most essential, and well will it become those interested as owners and occupiers to consider and consult freely upon the improvements which can be effected for their mutual benefit and the promotion of the general prosperity. If the loss of a few millions produces such reverses as we have this year experienced, what would not the general prosperity be increased by producing a few millions worth of food annually beyond our present average? We believe it to be a great national question, and one in which all classes of the community are interested. If enlightenment is infused into the general management of landed property, capital will naturally follow as a sort of investment, and the increase may indeed be vast. Even Suffolk, well farmed as she may be, could augment her produce 25 per cent. by improvements and reclamation. As a step to progress it was a matter of great satisfaction to us to hear a public man from the western division of the county express his experience of the perfect foolishness of the many leases and agreements which were in the course of business laid before him, and his intention to propose upon the committee of the Suffolk Agricultural Association a prize for the best copy of a lease or agreement suitable for the county. It is the experience of every public man that the want of a good sound sensible lease, agreement, or security is the grand obstacle to investment; and we trust so sensible a proposition as a prize for the best and most suitable form will not meet with rejection. The wheat plant has improved in appearance. Barley looks well. Peas and beans are a good plant, and growing fast. Mangel wurzel are up in some cases. The past few weeks have been very favourable for fallow-work, and much progress has been made. Lambs are a very good crop. Feed still scarce, but now growing rapidly. The census of 1861 shows the importance of retaining the present labour in the county: we know there is an abundance under the present depression, and the difficulty to find money wherewith to employ, but we look for a brighter future.

M I D - K E N T.

Whatever may have been the weather the last three months elsewhere, certainly it has been all that could be wished for in Kent—mostly dry, to allow of the cleaning of orchards and other grounds that became foul through the continued wet of last year, and yet sufficient rain to meet the wants of vegetation of the present season. The advantages of this are, that work of most kinds has advanced in a more satisfactory way than last year, and though all crops are not alike promising—on the contrary, many are the reverse to that—still, so far as the advantage of a favourable spring is concerned, we have no cause to complain; but to go into detail, I may say that wheat on the whole looks indifferent, some being ploughed up, owing to the ravages of the slug and the effects of the severe weather. Autumn-sown peas are also bad in many places; and the same may be said of beans. Seed corn is however more promising, and such crops as lucerne, sainfoin, &c., where grown, look tolerably well. Grass is more abundant than was at one time apprehended, and with favourable weather for the next fortnight we may perhaps have a good hay crop. Hops (our most important production) are variable; in some places looking as well as can be wished, in others as bad as can be; in fact, many plants have died from the rains of last summer and autumn, and we hear of vermin attacking

them the present season. Fruit is, in a general way, a failure, gooseberries suffering so much from the birds, and the apple-bloom being thin, there cannot be much fruit expected. Cherries, in a general way, promise best, but they cannot be regarded as safe yet. Plums under an average crop, and pears very few indeed. The position of many of our hop and fruit growers is far from enviable, the great labour-expenditure of last year not being met by anything selling well in return, very few hops being grown, and those remaining in most cases in the hands of the grower yet, with no prospect of getting rid of them; and the fruit of last year also realized very little, so that the prospect of a more abundant season is ardently wished for. In addition to these evils, sheep have done badly in many places, and great losses have been sustained on the heavy lands, not well drained; but in our own case they have done better than in the winter of 1855-56, but the lambing has not been very successful, and the number of barren ewes far exceeds what we ever had before. Feed is now tolerably plentiful, and with a nice steady rain, in a week or so the crop of grass may be expected to be good. The late dry weather has, however, been of infinite service in assisting to clean and mellow the tillage ground, and the digging and hoeing in orchards have been done to advantage, and we are in hopes we shall not have occasion to complain of a want of water so much as in the seasons of 1858 and 1859, the ground in a general way getting moist underneath, although the rainfall of the last three months has been much below the average, but some cold north-easterly winds prevailing in the early part of May checked vegetation very much; some more genial weather following has, however, renovated it again, and I hope my next communication will record a more favourable season in many respects than we have had for some time, as it is much wished for; and not only the well-being, but the solvency of a great many small farmers in the neighbourhood depends on its being so; and it is to be hoped, as well for their sakes as for the country in general, that the summer of 1861 may be a fine and productive one.—J. R.—May 25.

THE VALE OF THE TEES.

The weather during the last six weeks has been droughty, with the exception of some showers about the 12th instant. Rain is now very much needed: the turnip and clover seeds cannot germinate for want of moisture; the clods on the land working for turnips are nearly as hard as stones, almost defying our best implements to crush them. The wheat, as is usual in dry weather, has done well, and looks as well as it usually does at this time of the year, with the exception of that which was sown in a too-wet state, which caused the seed to perish. Fortunately, we do not see many of those missed crops. The spring corn came up well, but now wants rain. Grass is short, having been kept back by the frosts the second week in May. Fat cattle is scarce, and fetch good prices. Our corn markets are well supplied with wheat, but it is of inferior quality, and the price much less than we expected to see it, considering the bad crop of last year. Hinds and servants who changed masters last term have got better wages.—May 24.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

CAMBORNE FAIR was well attended, but fat cattle were scarce; the cattle fair generally was not well supplied, and but few sales took place. The horse fair was much better; a number of fine horses being offered, and sales effected at good prices.

EVESHAM FAIR.—Good attendance of buyers, and a large supply of beef of fine quality, but demand slack; prices from 6½d. to 7d. Mutton, shorn, plenty on offer, quality middling, but a brisk sale at 7d. to 7½d. Veal, moderate supply and quality. Not much doing in cows and calves. In sheep a good trade was done; the supply was large, and quality good; a moderate demand for sheep and lambs and pigs. Horses were plentiful of the ordinary sort, but the trade ruled dull. A large quantity of prime sheep were sold (600), and also some fine store cows, at high rates. Mr. Tredwell sold some good cattle, horses, cows, and sheep, at fair prices.

FALKIRK FAIR.—For milch cows the prices were still high, but grass beasts were difficult to sell. Milch cows (first-

class) would range from £14 to £18, second quality from £10 to £14, and inferior kinds from £10 to £7. It was a stiff market throughout, and at the close a clearance was not effected. The show of horses was meagre, and few sales were effected.

GLOUCESTER MONTHLY MARKET.—A short supply of cattle and sheep, and especially of beef, and consequently there was a ready sale at advanced prices. Sheep were also very limited in number, and former prices were fully maintained; lambs were in demand, and sold readily. Trade was generally good. Beef from 7d. to 7½d., mutton from 7d. to 7½d., lamb from 8d. to 9½d. per lb.

ILSLEY SHEEP FAIR.—The supply was good, and the sheep generally were in good condition. There was a numerous attendance of dealers. Business commenced rather slow, but during the day nearly all changed hands, at prices a turn in favour of the purchaser.

IPSWICH.—HANDFORD HALL FAIR.—There was a slow trade, what little there was being the result of the rain on the previous evening, which it was thought would improve the feed, the shortness of which is the subject of considerable complaint. Beef 8s. to 8s. 6d. per st. Lambs ranged from 15s. to 22s., couples from 48s. to 54s., and some, it was said, realized 63s.

KELSO FORTNIGHTLY MARKET.—A small attendance of farmers, and the show was a poor one. Beef may be quoted at from 7s. 6d. to 8s. per stone, and mutton 6d. to 6½d. per lb. There was a pretty good show of cows, and for these there was a fair demand. Bred cows realized from 13l. to 15l., Ayrshire cows brought from 12l. to 14l. 10s.

LUDLOW FAIR.—Store pigs sold well; and fat sheep out of the wool realized 7½d. per lb. There was a good demand for cows and calves of fair quality; and beef fetched 7d. per lb. Horses there were few, and scarcely anything really superior.

MALTON FAIR.—The fair was crowded with cattle, chiefly lean beasts. The best English stock found buyers at average rates; but owing to the continued dry weather and the backward state of the grass lands the trade was not brisk, and the droves of poor quality were nearly all left unsold. Lean sheep were not plentiful, and demand slow. Fat beasts and sheep, and cows for dairy purposes, maintained the firm aspect of late markets. Pigs few and dear. Lambs averaged 10d. to 1s. per lb.

MAIDENHEAD FAIR.—A pretty good supply of cattle, sheep, pigs, and horses, and mostly of a quality superior to those we have seen for several years. The trade appeared more active than usual.

MORTONHAMPTSTEAD MARKET was pretty well attended, and a good share of business was done. Good cows and calves sold at from 12l. to 16l., fresh barreners, 7s. to 8s. per score, steers in good condition 10l. to 12l. each, fat lambs 7½d. to 8d. per lb., good keeping sheep in their wool 35s. to 42s. each.

ROCHDALE FAIR.—The show was middling in quantity, and fair in quality; but there was only little inquiry except for calving cows, which sold readily, the prices being rather easier than at recent local fairs. Horses were in good show, and the few sold fetched good prices.

ROTHBURY FAIR.—The show of both cattle and sheep was small, and met with a slow demand at prices 10 per cent. below those of last year. The stock shown was in fair condition, and was mostly sold. Two-year-old cattle brought from 9l. to 11l. each, one-year-old from 5l. to 7l. each. Cheviot ewes and half-bred lambs from 30s. to 32s. per couple, half-bred hogs from 25s. to 28s., Cheviot wedder hogs from 18s. to 21s.

SANDHURST FAIR.—Our annual fair was held on Saturday last, and was tolerably well attended. All kinds of store cattle met a dull sale, at somewhat lower prices.

SHREWSBURY FORTNIGHTLY CATTLE MARKET.—A capital show of stock, and somewhat in excess of the demand. Prime beef reached a trifle over 7d., inferior 6d. to 6½d.; mutton (shorn) 7½d. to 7¾d. per lb. Lambs 20s. to 33s. each. Cows and calves, of good quality, scarce and dear; fresh barreners fetched good prices, but lean stock was lower; fat calves, 5d. to 7d. per lb., according to quality; small store pigs sold well, small ones lower.

ST. IVES FAIR.—A large supply of store beasts; the trade was very slow for all descriptions except good fresh steers. Store sheep were in good supply; demand by no

means active. Horses were in average supply; the trade was very slow, and lower prices had to be submitted to, except for the very best cart-horses, which sold at good prices.

TOLLER DOWN FAIR was well supported and attended, but business was quite a drag. Down ewes sold as low as from 22s. to 30s.; horses, 45s. to 50s.; calves from 60s. to 100s., the latter being very choice cows and calves £9 to £10

TRURO FAIR.—There was a large attendance, and in consequence of the scarcity of keep, a larger number of fat bullocks was brought to the fair than is generally seen there. The demand also was much better than it has been for some time past, there being a good attendance of butchers, including some from Plymouth. The best beef realized from £3 to £3 5s. per cwt. Store bullocks were not so much in demand, in consequence of the scarcity of keep before referred to. There were very few fat sheep in the fair, and not much inquiry for them; those sold made about 8½d. per lb. in the wool.

WHITSUNBANK FAIR.—For sheep there was a good demand, but cattle was a dull sale. Bred hogs in their wool sold readily at from 35s. to 45s. a head, and half-breds from 30s. to 38s., an advance we do not over-estimate in quoting at 4s. a head more than has been realized at the recent farm sales in this district, and 4s. or 5s. a head above last year's prices at this fair. There were a good many small lots of ewes and lambs, which realized extreme prices, ewes with twin lambs bringing as high as £4, and ewes with single lambs as high as 65s. There were some very fresh lots of cattle shown by farmers in the immediate neighbourhood. The demand for cattle was not, however, so good as for sheep, and a good many were unsold. Good two-year-olds brought from £10 to £14, and young cattle from £5 to £8. Of cows there was an extra number, and they readily found purchasers at from £10 to £14. Horses were pretty numerous, but of a very inferior description: for useful farm-horses there was a good demand, and a good many changed hands at from £30 to £40.

YORK FAIR.—The number and quality of horses shown was rather superior to those exhibited for some years. There were some of middle size, suited for summer ride and drive, of good breed and action, which sold well; and some for agricultural and general road business, which had similar demand. Calving and dairy cows met with fair demand for the cheese dairy districts. Little was done in Shorthorned grazing steers and heifers, the quality being only inferior. A fair number of Irish grazing beasts, and a moderate amount of business was done in them.

IRISH FAIRS.—TEMPLEMORE: Three-year-old heifers ranged at from £12 to £14, two-year-olds £8 to £11, yearlings £7 to £8, ewes and lambs 40s. to 50s. **BALLINGARRY:** There was a large supply of stock; the demand was good, and the attendance of buyers numerous. Fat cattle ranged at from £14 to £18, reu milch cows at from £9 to £15, springers £9 to £14, strippers £8 to £13, two-year-old heifers £7 to £10, yearlings £4 to £5; bonhams, 17s. to 21s. per couple. **BALLYCLARE** was not, by any means, so good a fair, either in show of stock or in business transacted, as many former fairs, or even as that of May last. Very useful farm horses were largely in supply, but not in brisk demand, except for very useful animals. The show of black cattle was of an average amount, and springers brought from 20s. to 10s, a head less than last fair. Sheep were few, in bad condition, and brought only from 7d. to 8½d. per lb.; lambs from 7½d. to 8½d. per lb, and in poor supply. **CAMLOUGH:** In general, all kinds of cattle were in good demand throughout the day. Springers were sought after, and owners realised fair prices. Dry cattle ranged from £4 to £12; the supply of this description of cattle was greater than the demand. **PORTADOWN:** The supply of beef cattle was inadequate to the demand, and prices were consequently high, 65s. per cwt. being the extreme figure. Half-finished beasts were bought sparingly, the grass being rather backward; the current rates were from £8 to £12. Well-bred springers were anxiously sought after by dealers, and brought fine prices, say from £10 to £14. **DUNDALK:** There were not many lots of fat beasts exhibited. The demand for them was active, and those of good quality sold freely at 7d. to 7½d. per lb. Three-year-old store cattle sold at 10 to 12 guineas; two years sold at £8 to £10; and yearlings from £3 to £6 10s. There was a fair supply of sheep, and prime wethers rated at £3 to £3 10s. The top price for lambs was 31s. 6d.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The first fortnight in May was cold and ungenial. The heavy snow-storm of the 4th, followed by a frosty night, severely cut up the fruit; but the want of moisture was so great in the fields, that service was done to the corn, and another fall of rain a week afterwards proved a fine preparation for the sunny and warm weather which succeeded. An almost instantaneous benefit was perceptible, both in the meadows and corn fields, and steady and rapid progress has since been made in the growth of all cereals inspiring the hope that the harvest of this year will be gathered well and in season. The wheat plants that outlived the rough weather now generally look promising; and for the quantity on the ground, there may be a fair yield. This favourable change is great cause for thankfulness; for with another such year as the last, and America no longer to depend on, the consequences to this country might have been fearful. Considering the vast improvement in the weather and prospects, the markets have stood their ground well, English wheat of fine quality being very little altered in value; and the fact of its scarcity is now becoming so plain, by the falling off of supplies, that millers will soon have to look exclusively to foreign imports. These have continued on a large scale, and the granaries are as yet well stored, and heavy imports are still on their way from Europe and America; but how long exports will continue from the latter country none can divine, in its present distracted state; and the abstraction of a vast amount of agricultural labour for military purposes must throw much land out of cultivation and cripple the divided country for an indefinite period. Markets here up to the next harvest must be determined by the weather. Should it continue propitious they must be heavy, and perhaps lower for new foreign, which is mostly damp; but fine old will be still more largely required to make up the deficit in English growth, and is not likely to be much cheaper. The rise of prices in France from drought, should it continue, must soon bring orders here, and indeed buyers have already appeared to take advantage of the present dullness; and as in that country, as well as in this, there is much mis-plant, a heavy crop, under the most favourable circumstances, is not to be looked for. The new corn-law is now before the Corps Legislatif, proposing the abolition of the sliding-scale and the substitution of nominal duties; and should it pass, is more likely to raise prices here than otherwise, as the imports of Wheat into France for the first four months of the present year have more than doubled the exports; and the offers at Paris and the country markets are diminishing from the evident exhaustion of stocks. In Germany the wheat has passed through the winter fairly, and since the warm weather has greatly improved; fine rains, too, have fallen in Spain and Italy, though the latter country

has partially suffered. In Egypt prices are declining, and prospects good. At Odessa supplies have not yet been very free, but the markets have ruled dull, and fair quantities are expected. In Algeria everything looks well, and the barley harvest has begun. Prospects therefore, on the whole, are fair, with the exception of that unhappy country so lately called the United States, where the freedom of the master is so notoriously damaged by the bonds of his slave.

The following quotations show the recent state of foreign markets for wheat: At Paris, the best wheat was worth 63s. 6d.; at Bordeaux, 64s.; Amsterdam quoted 72s. for the finest Polish and Rostock; 63s. was the price at Brussels; wheat at Cologne was selling at 56s. 6d.; at Mayence about the same; kiln-dried red at Groningen was 50s., white 54s.; 60lbs. Saale wheat at Hambro', 58s. 6d., 61lbs. 59s. 6d. per qr. Mecklenburg 58s., Sleswick and Holstein 54s. to 55s. cost and freight; 61lbs. Pomeranian, 57s. ditto. Odessa prices were 41s. to 49s., Galatz to 30s., free on board. Soft wheat at Ibraila 32s., at Venice 52s.; Danubian at Florence was worth 43s., Blanquillo at Santander 63s. per qr. The civil war in the United States had not yet much affected prices, the lower sorts being more dull at New York. Milwaukee Club was about 40s. 4d., winter red 43s. 4d., Indiana white 46s., Kentucky white 58s. 8d., all per 480lbs.

The first Monday in London commenced on a moderate English supply, with a good foreign arrival. The show of samples from Kent and Essex during the morning was small, with very little fine, and this scarcely supported its price, all below it being 1s. per qr. lower, with a slow sale. The foreign trade was very inanimate, the effect of the importations a fortnight back being still felt, and though there was a retail sale for fine qualities, the value of damp new was nominal and cheaper to sell. Sales off the coast participated in the dullness, and were only made on rather easier terms. The country markets did not respond to the heaviness reported in London, rates being mostly unaltered, and some dearer. Birmingham was so, 1s. per qr., and later in the week the tendency to a rise was more general; Norwich, Leicester, and Lincoln being up 1s. Grantham, Newcastle, and York were 1s. to 2s. higher. Tuesday's market at Liverpool was firm, and on Friday advanced 1d. per cental. Scotland and Ireland were but dull.

On the second Monday there was less foreign wheat, and but little of home-growth. Kent and Essex made very small additions during the morning, and millers who wanted good samples had occasionally to pay 1s. per qr. more; but it was difficult to quit inferior sorts at unaltered rates. For good foreign there was more inquiry, and buyers found the market against them, but factors could make no way at any advance. A good

business off the coast was transacted, at fully former terms. The country, always more ready to follow a rise than decline, was in many places 1s. per qr. dearer, as Hull, Leeds, Newcastle, Stockton-on-Tees, Boston, Spalding, Lynn, Newark, Newmarket, and several other towns; but Birmingham noted 1s. per qr. decline. Bristol and Gloucester were only firm. Liverpool on Tuesday was 2d. per cental dearer for red American wheat, but not for other sorts, and the last market was scarcely supported. The tendency of the Scotch and Irish markets was upwards.

The third Monday's supply was very like the second, both foreign and English being moderate. The Essex and Kentish stands had but few samples this morning, and perhaps this saved the market from a decline which, from the summerlike weather experienced, was anticipated. There were very few buyers of foreign, and to sell factors must have submitted to lower terms; but we did not hear of anxious holders, especially of fine sorts. The trade off the coast was languid, but rates much the same. The country markets this week, though generally dull, were but little altered, only a few, as Boston and Norwich, being 1s. per qr. down. Liverpool on Tuesday was unaltered, but the continuance of fine weather up to Friday made a decline on that day of 1d. to 2d. per cental. Some places in Scotland, with Edinburgh, were rather cheaper for wheat; and in the Irish markets almost nothing was doing.

The fourth Monday opened on the heaviest foreign supply, with about the usual quantity of home-growth. Very little was sent up from the near counties during the morning, more especially from Kent. The scarcity, therefore, of fine English kept up its value; but for low sorts there was no sale. The heavy arrival of foreign, with the continuance of fine weather, made an almost cessation of business. Factors did not generally offer their fine samples at less money; but to sell they were quite 1s. per qr. cheaper, and new and inferior sorts could not be placed at a greater reduction. Sales off the coast were made at 1s. per qr. less money, there being quite a fleet offering.

The imports into London for four weeks were 13,579 qrs. English, 101,864 qrs. foreign, against 23,123 qrs. English and 61,966 qrs. foreign, in 1860. The imports into the kingdom from April last were 701,582 qrs. wheat, 384,410 cwt. flour. The averages at the beginning of the month were 55s. 8d., closing at 54s. 4d., noting a decline of only 1s. 4d. per qr. The exports from London in May were 1,687 qrs. wheat, 478 cwt. flour.

The flour trade, like that of wheat, has been very heavy, but with little change in value. Norfolks, which for the first fortnight had been heavy when the weather was cold, became worse as the temperature rose, and there were free foreign imports, closing at about 38s. Barrels, which were readily saleable before the heavy imports of the last week, were reduced 6d. to 1s., French and Spanish being also reduced 1s. per sack. The top price of town-make has been steady at 55s. per sack. The imports for the four weeks into London were 58,783 sks. English, 7,724 sks. 64,180 brls. foreign,

against 68,241 sks. English, 4,896 sks. 4,442 brls. foreign in 1860.

The barley trade has been very slow during the cold weather; there was some little demand for malting sorts, as a finish of the season; but the rates of such, if any can still be found, are unreliable. Those for distillation and grinding have barely sustained their prices, notwithstanding very moderate imports. The growing crop since the rains has greatly improved. The imports for the four weeks were, in British sorts 3,812 qrs., in foreign 20,527 qrs.; last season they were 4,365 qrs. British, 38,957 qrs. foreign. The total imports in April were 169,228 qrs.

The malt trade all through the month has been dull; but no alteration has been noted in prices.

The oat trade, in consequence of free imports and fine weather, has experienced a reduction of about 1s. per qr. on good corn, the decline on badly-conditioned and low qualities being 1s. to 2s. Early in the month the scarcity of good qualities rather raised prices, and the decline noted took place during the last fortnight. As stocks of good corn must be working up close, and are not abundant abroad, we don't see much prospect of lower rates till the Russian supplies get in. At Riga prices have lately been rising, and good corn is worth 18s. 6d. free on board. The imports for four weeks were 4,523 qrs. English, 897 qrs. Scotch, 5,596 qrs. Irish, and 138,696 qrs. foreign, against 2,975 qrs. English, 25 qrs. Scotch, 2,808 qrs. Irish, and 88,758 qrs. foreign in 1860. The imports for April throughout the kingdom were 262,917 qrs.

Beans, in consequence of good foreign imports, have rather cheapened, say fully 1s. per qr., the decline taking place on the fourth Monday; but unless the foreign supplies are larger than expected, there does not seem a prospect of much further reduction, the inferiority of last year's crop leading to a wasteful consumption in the rickyards. The imports for the four weeks were 2,894 qrs. English and 11,485 qrs. foreign, against 2,997 qrs. English and 5,842 qrs. foreign in 1860. The imports for April into the kingdom were 51,172 qrs.

Scarcely any English Peas have come to market during the month, and the scarcity of maples has kept up the prices to a fancy height, say 48s. to 50s.; duns have also been dear, and most of the foreign being inferior, white boilers have been used for horse feed and such purposes, and served rather to lower beans. The imports for the four weeks were 179 qrs. English and 4,594 qrs. foreign, against 4,365 qrs. English, 38,957 qrs. foreign in 1860. The total imports in April were 31,543 qrs.

The linseed trade has been brisk, and rising 1s. to 2s. per qr., though it closed calm. There have only been moderate imports, and free exports, with a large demand for cake, at full prices. This has raised rates eventually at Odessa.

The seed season closed with extraordinary dullness, and France, which ordinarily is the chief source of supply, took off many neglected American parcels of red cloverseed. Not much stock now remains, and prices depend on the prospects of the growing crops. They have much improved lately, many pieces looking strong. White seed

closed in small compass, and beyond speculative rates. Trefoil has found no attention. Canary-seed remains a drug from its inferior quality. Rapeseed steady. Mustardseed quite neglected, and prices are nominal.

CURRENCY PER IMPERIAL MEASURE.

		Shillings per Quarter.	
WHEAT, Essex and Kent, white, new 40 to 66 fine old 66 to 74			
" " red	39 62 ..	66	70
" Norfolk, Linc., and Yorks., red	39 60 ..	64	68
BARLEY, malting 31 to 37 .. Chevalier, new	34 42		
Grinding 29 30 .. Distilling	31 35		
MALT, Essex, Norfolk, and Suffolk 53 to 60 .. fine	66 76		
Kingston, Ware, and town made 54 62 ..	65 76		
Brown	56 59		
RYE, seed new	32 37		
OATS, English, feed 19 to 24 .. Potato	25 33		
Scotch, feed 23 27 .. Potato	26 33		
Irish, feed, white 19 to 23 .. fine	23 26		
Ditto, black 19 23 ..	25		
BEANS, Mazagan 32 to 41 .. Ticks	32 41		
Harrow 33 47 .. Pigeon	45 51		
PEAS, new, white, boilers 39 45 Maple 42 to 48 Grey 37 42			
FLOUR, per sack of 280 lb., Town, Households	49 55		
Country 35 to 39 .. Households	40 47		
Norfolk and Suffolk, ex-ship	37 38		

FOREIGN GRAIN.

		Shillings per Quarter.	
WHEAT, Dantzic, mixed, new 61 to 67 .. extra old 70 to 76			
Konigsberg " 54 64	69 74		
Rostock " 60 63 fine old	69 72		
American, red 60 63 white	62 66		
Pomera, Meckbg., & Uckermark, red, new	57 62		
Silesian, red 57 62 white	60 65		
Danish and Holstein, red	57 62		
Russian, hard 53 to 55 .. French 58 to 62 .. white 60 64			
St. Petersburg and Riga	54 58		
Rhine and Belgium, new	58 64		
BARLEY, grinding 27 to 29 .. Distilling 31 34			
OATS, Dutch, brew, & Polands 20 29 .. Feed 15 19 24			
Danish and Swedish, feed 22 26 .. Stralsund 22 26			
Russian	23 26		
BEANS, Friesland and Holstein	36 43		
Konigsberg 39 to 45 .. Egyptian 37 38			
PEAS, feeding 38 40 .. fine boilers 40 42			
INDIAN CORN, white 38 40 .. yellow 38 41			
FLOUR, per sack .. French 40 46 .. Spanish p.s.k. 46 48			
American, per brl 30 32 .. extra & dbl. 33 34			

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:		Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
April 13, 1861	55 10	37 5	24 1	35 11	41 6	40 0							
April 20, 1861	56 9	37 3	23 5	37 10	42 3	39 6							
April 27, 1861	55 8	37 11	24 8	32 8	42 7	40 8							
May 4, 1861	55 4	36 10	24 7	35 2	42 11	40 8							
May 11, 1861	55 0	36 4	25 0	—	43 10	40 11							
May 18, 1861	54 4	35 11	25 1	32 0	44 4	40 5							
Aggregate Average	55 8	36 11	24 6	34 9	42 11	40 4							
Same time last year	51 2	37 1	24 10	34 3	42 3	39 2							

COMPARATIVE AVERAGES—1861-60.

From last Friday's Gaz.		s. d.	From Gazette of 1860.		s. d.
Wheat	70926 qrs. 54 4		Wheat	95250 qrs. 52 1	
Barley	10438 .. 35 11		Barley	5428 .. 36 6	
Oats	9833 .. 25 1		Oats	8071 .. 25 3	
Rye	45 .. 32 0		Rye	52 .. 36 2	
Beans	4855 .. 44 4		Beans	3592 .. 44 3	
Peas	191 .. 40 5		Peas	584 .. 39 5	

FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT.

PRICE.	April 13.	April 20.	April 27.	May 4.	May 11.	May 18.
55s. 10d.	..	..	..	..	..	..
55s. 9d.	..	..	..	..	..	..
55s. 8d.	..	..	..	..	..	..
55s. 7d.	..	..	..	..	..	..
55s. 6d.	..	..	..	..	..	..
55s. 5d.	..	..	..	..	..	..
55s. 4d.	..	..	..	..	..	..

PRICES OF SEEDS.

BRITISH SEEDS.

MUSTARDSEED, per bush., brown	11s. to 15s.
CORIANDER, per cwt.	14s. 16s.
CANARY, per qr.	50s. 58s.
TREFOIL	24s. 30s.
TAKES, winter, new, per bushel	10s. —s.
LINSEED, per qr., sowing —s. to 74s. crushing	58s. to 60s.
LINSEED CAKES, per ton	£9 10s. to £10 10s.
RAPESEED, per qr.	70s. to 76s.
RAPE CAKE, per ton	£5 10s. to £6 0s.

FOREIGN SEEDS, &c.

CLOVERSEED, red 46s. to 56s.	white 72s. to 90s.
TREFOIL	18s. 28s.
HEMPSEED, small, —s. per qr.	Dutch —s. 48s.
CORIANDEE, per cwt.	16s. 18s.
CARAWAY	32s. —s.
LINSEED, per qr., Baltic 50s. to 52s.	Bombay 52s. 56s.
LINSEED CAKE, per ton	£9 10s. to £11 0s.
RAPESEED, Dutch	—s. to —s.
RAPE CAKE, per ton	£5 0s. to £6 0s.

MONTHLY RETURN.

AN ACCOUNT SHEWING THE QUANTITIES OF CORN GRAIN, MEAL, AND FLOUR, IMPORTED INTO THE UNITED KINGDOM, AND ADMITTED TO HOME CONSUMPTION, IN THE MONTH OF APRIL, 1861.

Species of Corn, Grain, Meal, and Flour.	Imported from foreign Countries.	Imported from British Possessions out of Europe.	Total.
	qrs. bush.	qrs. bush.	qrs. bush.
Wheat	699833 7	1748 3	701582 2
Barley	169223 7	—	169228 7
Oats	262915 1	2 4	262917 5
Rye	3886 6	—	3886 6
Peas	31148 6	394 2	31543 0
Beans	51172 3	—	51172 3
Maize or Indian Corn	194452 5	—	194452 5
Buck Wheat	121 7	—	121 7
Bere or Bigg	—	—	—
Total of Corn and Grain	1412760 2	2145 1	1414905 3
	cwts. qr. lb.	cwts. qr. lb.	cwts. qr. lb.
Wheat Meal and Flour.	384319 2 2	90 2 14	384410 6 16
Barley Meal	—	—	—
Oat Meal	8236 2 12	—	8238 2 12
Rye Meal	37 2 14	—	37 2 14
Pea Meal	—	—	—
Bean Meal	—	—	—
Indian Meal	822 1 16	—	822 1 16
Buck Wheat Meal	16 2 0	—	16 2 0
Total of Meal and Flour.	393434 2 16	90 2 14	393525 1 2

HOP MARKET.

BOROUGH, MONDAY, May 27.—The reports from every district of the plantations speak of a strong attack of fly, which has very much increased during the last few days. Our market is exceedingly firm, but there is little business doing, owing to the scarcity of fine samples. The duty put at £140,000.

Mid and East Kents	80s., 140s., 200s.
Weald of Kents	60s., 120s., 168s.
Sussex	60s., 80s., 126s.
Yearlings	110s., 140s., 189s.

POTATO MARKETS.

SOUTHWARK WATERSIDE.

LONDON, MONDAY, May 27.—During the past week the arrivals coastwise and by rail have been good for the season; but owing to the very warm weather the consumption has fallen off more than one-half, and trade very dull, at a reduction in prices; the following are this day's quotations:—

Yorkshire Flukes	110s. to 130s. per ton.
Lincolnshire Regents	80s. to 90s. "
North Berwick do.	100s. to 110s. "
Perth, Forfar, and Fife do.	70s. to 90s. "
Ditto, do. do. Rocks	65s. to 75s. "
Ditto, do. do. Reds	60s. to 70s. "

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, May 27.—The supplies of old potatoes on sale here are moderately extensive, and the trade generally rules dull, on rather easier terms. New potatoes arrive in small quantities, and are selling at 10s. to 20s. per cwt.

York Flukes	130s. to 150s.
Scotch Regents	90s. to 160s.
Ditto Cups	65s. to 80s.
Ditto Rocks	60s. to 90s.
Dunbar Regents	140s. to 160s.
Other kinds	60s. to 85s.

COUNTRY POTATO MARKETS.—YORK, May 18: Potatoes 12d. per peck, and 3s. 3d. to 3s. 8d. per bushel. SELBY, May 20: Potatoes 7d. to 9d. per stone. LEEDS, May 21: Potatoes 1s. to 1s. 2d. wholesale, and 1s. 2d. to 1s. 4d. retail per 21lbs. LEYBURN, May 17: Potatoes 3s. to 4s. per bushel. SHEFFIELD, May 21: Potatoes sell at from 11s. to 16s. per 18 stones. RICHMOND, May 18: Potatoes 1s. 2d. per peck. STOCKTON, May 22: Potatoes 3s. 6d. to 4s. 6d. per bushel. MANCHESTER, May 14: Potatoes 9s. to 13s. per 252lbs.; new do. 10s. to 13s. per score.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, May 27.—Our Butter trade is in a prostrated state, and prices are nominal.

Fine Dorset 98s. to 100s. per cwt.
Middling nominal.
Fresh 8s. to 12s. per doz.

BELFAST, (Friday last).—Butter: Shipping price, 100s. to 108s. per cwt.; firkins and crocks, 10d. to 10½d. per lb.; Bacon 63s. to 65s., Hams, prime 78s. to 82s., second quality 60s. to 66s. per cwt.; prime mess Pork 92s. 6d. per barrel; Beef, 120s. to 130s. per tierce.

CORK BUTTER EXCHANGE, (Saturday last).—Owing to the continued dryness of the weather, the receipts of butter during the week were rather limited, and, since the commencement of the season, are about 1,500 firkins short of what they were up to this time last year. Prices have declined considerably, and have still a downward tendency. Since Monday, firsts fell from 114s. to 110s., seconds from 109s. to 104s., thirds from 98s. to 92s., fourths from 84s. to 78s., fifths from 62s. to 58s., and sixths from 50s. to 46s. The demand continues fair at the quotations, which are considerably lower than this time twelve months.

GLASGOW, (Thursday last).—There was a small supply of Cheese, but sufficient to meet a quiet trade. About six tons passed the weigh-house, and two carts in the Bazaar. Early made, 56s. to 60s.; late and secondary, 44s. to 54s.; skim milk, 21s. to 24s. per cwt.

WOOL MARKETS.

ENGLISH WOOL MARKET.

LONDON, MONDAY, May 27.—There is only a limited amount of business doing in all kinds of English wool, both for home use and export; nevertheless, prices are supported. The supply in the hands of the staplers is rather limited for the time of year, and the stocks held in the manufacturing districts are comparatively trifling.

Per sack of 240lbs.

Fleeces—Southdown Hogs	£18	0 to £18	10
Do. Half-bred Hogs	19	0	19 10
Do. Kent	17	10	18 10
Do. Southdown Ewes & Wethers	17	0	17 10
Do. Leicester do.	17	10	18 0
Sorts—Clothing, picklock	18	10	19 0
Do. Prime and picklock	17	0	18 0
Do. Choice	16	10	17 0
Do. Super	15	0	16 0
Do. Combing—Wethermatching ..	19	10	20 0
Do. Picklock	17	0	18 0
Do. Common	16	0	0 0
Do. Hog-matching	21	0	22 0
Do. Picklock matching	17	0	18 0
Do. Superdo	16	0	0 0

BRADFORD WOOL MARKET, (Thursday last).—The indispotion to buy continues, and becomes every week more apparent. The present prices almost entirely preclude business, and when sales are forced, some concession must be made. The supply of wool held by the trade is an average one for the time of the year, and a larger quantity is left over in the country than was to be found last year. It is thought that this, coupled with the probable heavy clip this year, must cause a degree of caution on the part of buyers until there is an amendment in the demand for yarns. Noils and Brokes: There is no quotable change to report either in demand or price.—*Bradford Observer*.

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS, Friday.—There has been very little doing in English or any sort of wool during the week, and prices continue without material alteration. The new clip of English wool will prove much heavier than that of last year, and will come to market during this fine weather in much better condition.

YORK WOOL MARKET, May 23.—The quantity of wool shown to-day, the first market for the new clip, has been between thirty and forty sheets, with a fair number of buyers. Most of the lots were sold. All ewe fleeces 20s. to 21s., half hog and ewe 21s. to 22s., hogs and wethers 22s. to 23s., all hog (if good-bred and in clean, tub-washed condition) 23s. 6d. to 24s. 6d. per stone.—*Yorkshire Gazette*.

LIVERPOOL WOOL MARKET, MAY 25.

SCOTCH.—The transactions in all kinds of Scotch is limited to what is required for immediate wants, at full rates. Stocks of all kinds are exceedingly light, and will be well used up before the new clip comes forward.

		s. d.	s. d.
Laid Highland Woolper 24lbs.	11	6 to 13	0
White Highland do	13	9	17 0
Laid Crossed do..unwashed....	14	6	16 6
Do. do..washed	16	0	18 6
Laid Cheviot do..unwashed....	18	0	22 0
Do. do..washed	22	0	28 0
White Cheviot do..washed....	34	0	42 0

FOREIGN.—The attention of the trade is still occupied with the public sales in progress in London going off satisfactorily. There is still a good inquiry here for all kinds of medium long stapled kinds, which command full rates.

FOREIGN AND COLONIAL WOOL MARKET.

	Per lb.	s. d.	s. d.
German, { 1st and and Elect.	2	4 to 4	6
Saxon, { Prima	2	4	3 0
and { Secunda	2	0	2 4
Prussian. { Tertia	1	8	1 10
COLONIAL:—SYDNEY—Lambs	1	2½	2 3
Scoured do.	1	4½	3 1
Unwashed	0	9½	1 1
Locks and Pieces	0	9½	1 8
Slips and Skin	0	11	1 8½
PORT PHILIP—Lambs	1	2	2 7
Scoured do.	1	2	3 2
Unwashed	0	8½	1 0
Locks and Pieces	0	6	1 9
S. AUSTRALIAN—Lambs	1	6½	2 0
Scoured do.	1	2	2 5½
Unwashed	0	8½	1 1½
Locks and Pieces	1	0	1 1
V. D. LAND—Lambs	1	4½	2 2
Scoured do.	1	0½	1 9½
Unwashed	0	0	1 6
Locks and Pieces	1	0	1 7½
CAPE OF GOOD HOPE—Fleeces	0	7	1 11
Lambs	0	10	2 0
Scoured	1	0	2 1
Unwashed	0	7	1 0

MANURES.

LONDON, SATURDAY, May 24.—Linseed Cakes have found a ready sale, at full prices. Imports during the week 786 tons. No Guano arrivals. All manures selling freely.

PRICE CURRENT OF GUANO, &c.

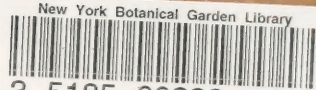
Peruvian Guano, direct from importers' stores, £12 5s. to £12 12s. p. ton.
Bones, £5 to £5 10s. per ton; ditto crushed, £6 5s. do; ditto dissolved, £5 10s. do; ditto half-inch lins. to 19s. 6d. per qr.; ditto dust, 19s. to 20s.
Animal Charcoal, (70 per cent. phosphate) £4 10s. to £5 per ton.
Coprolite, Cambridge, in London, whole 42s. to 44s., ground 55s. to 58s.; Suffolk, whole 35s., ground 46s. to 47s. per ton.
Nitrate of Soda, £13 15s. to £14 0s. Gypsum, 30s. per ton.
Salt, according to quantity and distance, 23s. to 27s.
Sulphate of Ammonia, £14 10s. to £15 per ton.
Sulphuric Acid, concentrated 1-845 lb. per lb., brown 1-712 0½d.
Superphosphate of Lime, £5 10s. to £6 6s. per ton.
Blood Manure, £6 5s. to £7 10s. per ton.
Linsed Cakes, best American, £11 5s. to £11 10s. (brl.), ditto £10 5s. to £10 10s. (bag) per ton.
Rape Cake, English, £5 5s. to £5 10s. per ton.
Marseilles Cake, £9 7s. 6d. to £9 12s. 6d. per ton.

E. PURSER,

London Manure Company, 116, Fenchurch Street, E.C.

END OF VOLUME LIV.

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